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PC WORLD

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Circle 187 on reader service card

JUNE 1991
VOLUME 9, NUMBER 6

PC WORLD

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Your Next Word Processor
155

Cover design by Bill Jensen
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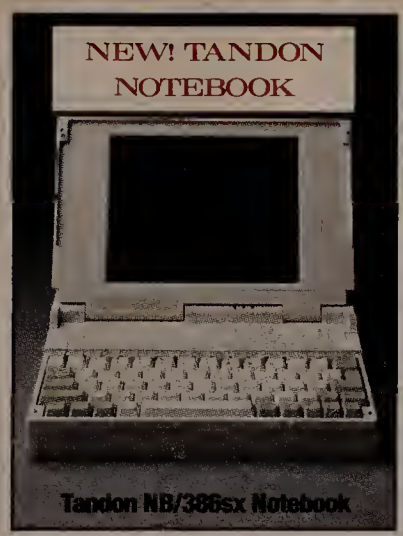

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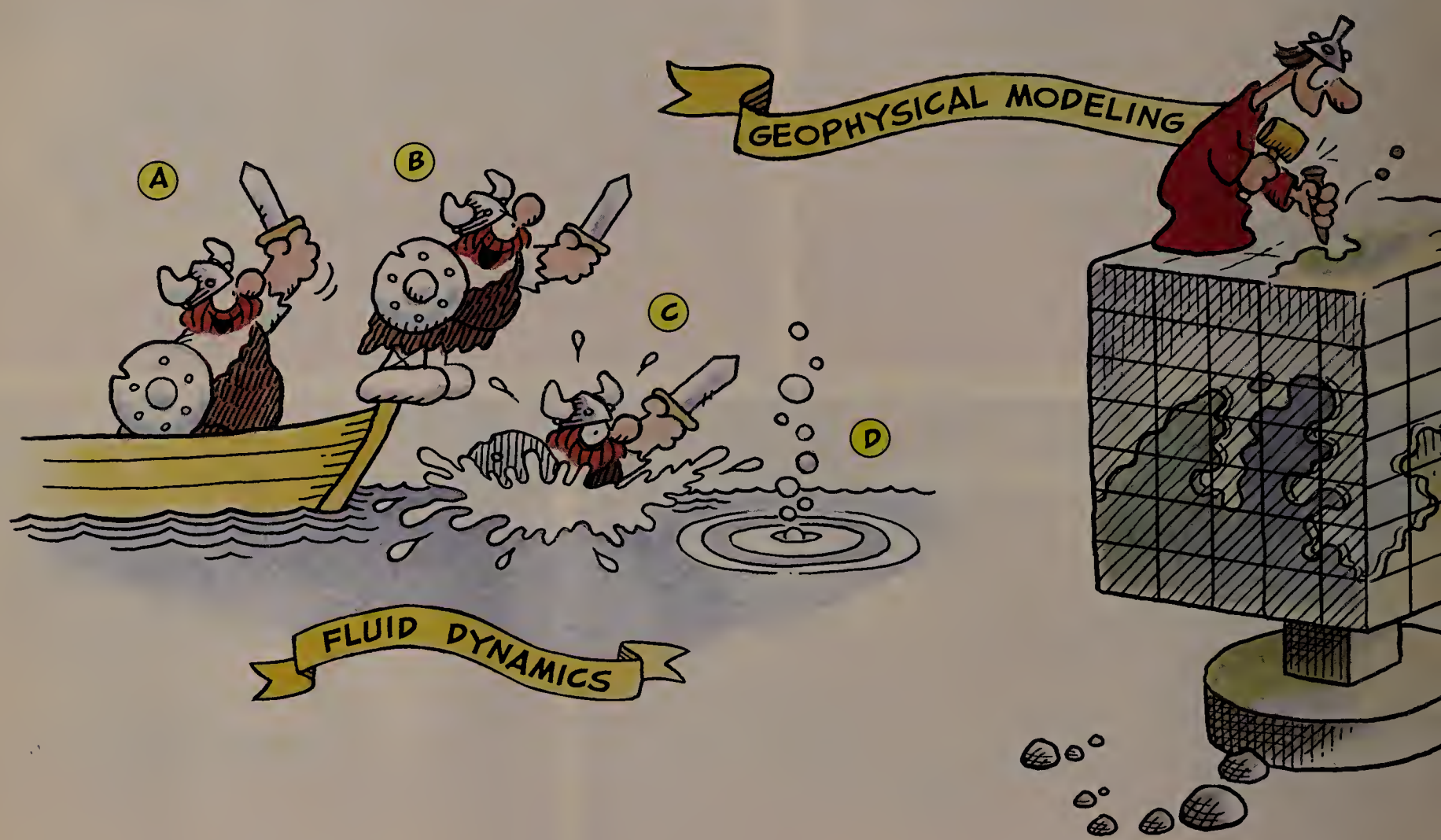

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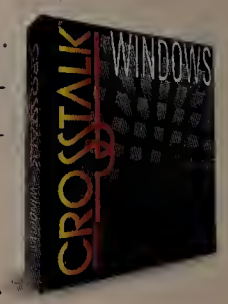

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Circle 62 on reader service card

We'd rather be in color: Associate Editor Daniel Tynan (left) and author Bob Weibel show off their shades.

ROBERT CARDIN

Color Comes Through

I see a slew of black-and-white handouts on new products, and after a while, I have trouble telling one handout from another," laments Associate Editor Daniel Tynan, coauthor of this month's cover story. "If you're creating a document or a presentation that's supposed to leave a lasting impression, do it with color."

You should have a color monitor already. But if you want to do more than admire colorful charts on screen, check out the Buyers' Guide to color printers, plotters, scanners, and slide recorders. For less money than you might think, you can buy the hardware to turn out memorable color flip charts, information-packed technical drawings, and slick 35mm slide presentations.

According to Bob Weibel, the cover story's other coauthor, you can't underestimate color's clout. While making a pitch for his own desktop publishing business, he's seen the evidence firsthand: "When color documents slide across the table, the deal closes a lot faster."

It's a color world, after all. But why is now the time to consider color output? As Weibel notes, you can now buy a 300-dots-per-inch color thermal printer for the same price the original black-and-white Hewlett-Packard LaserJet cost—and that means a mass market can't be far away. Tynan notes that at least one major printer manufacturer expects to sell as many color thermal printers this year as PostScript lasers.

Tynan observes that, as with the garden-variety laser printer, the proliferation of choices will be too much for some users. "Today's profusion of font options leaves users in danger of creating documents that look like ransom notes. Users are at even more risk of aesthetic disaster with color, since you can cram millions of colors into a single image."

Another problem involves matching the hues you see on screen to what comes out of the printer. Even on professional systems, this is dicey. "Ambient lighting near the monitor has a big effect on the quality of the preview," says Weibel. "Even the humidity level of the paper comes into play. As a printing professional, I've seen output look very different two weeks after it was printed, just because of a humidity change."

Professional systems have color standards to help match printer to monitor, but for PCs, no mainstream standard exists. In moments of frustration, Tynan feels that getting PC color hardware units to work together is "like hooking your blender to your VCR and programming it to pulverize."

Fortunately, color accuracy counts most when you want to print scanned photos—a task not really suited to the under- $10,000 class of printers we've focused on here. Instead, think logos, charts, drawings, and color typography. With such relatively undemanding tasks, Weibel suggests, you shouldn't split hairs about output quality. "If you have to hold output from two printers side by side to tell the difference, go for the unit that's easier to use, more expandable, and less expensive to operate."

If you're still bound and determined to drop four-color photos of your wares into marketing materials, you won't have long to wait. Predicts Weibel, "In another two years, you'll still pay $7000 for a color printer—but it'll give you photographic quality."

Eric Knorr
Editor

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PC MAGAZINE EDITOR'S CHOICE
Editor's Choice 386/SX16 1990

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Storage: 40Mb IDE hard drive. 1.44Mb or 1.2Mb floppy disk drive.
Memory: 2Mb RAM
Expansion: 7 expansion slots (6 16-bit and 1 8-bit).
I/O Ports: 1 parallel and 2 serial ports.
Video: 14″ VGA color monitor with 16-bit VGA color video adapter.
Keyboard: Enhanced 101 keyboard with tactile/click touch.
Compatibility: DOS, OS/2, Novell, Unix.

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AUSTIN 386/SX20 WINSTATION
STANDARD CONFIGURATION
Microprocessor: 80386SX running at 20MHz.
Special Features: Pre-loaded with Microsoft Windows 3.0 and MS-DOS 4.01. Microsoft mouse. GE on-site service.
Storage: 40Mb IDE hard drive. 1.44Mb or 1.2Mb floppy disk drive.
Memory: 2Mb RAM
Expansion: 7 expansion slots (6 16-bit and 1 8-bit).
I/O Ports: 1 parallel and 2 serial ports.
Video: 14″ VGA color monitor. 16-bit VGA color video adapter.
Keyboard: Enhanced 101 keyboard with tactile/click touch.
Compatibility: DOS, OS/2, Novell, Unix.

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Memory: 2Mb RAM
Expansion: 7 expansion slots (6 16-bit and 1 8-bit).
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Keyboard: Enhanced 101 keyboard with tactile/click touch.
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Storage: 125Mb IDE hard drive with 32K cache. 1.44Mb or 1.2Mb floppy disk drive.
Memory: 4Mb RAM
Expansion: 7 expansion slots (6 16-bit and 1 8-bit).
I/O Ports: 1 parallel and 2 serial ports.
Video: 14" VGA color monitor. 16-bit VGA color video adapter.
Keyboard: Enhanced 101 keyboard with tactile/click touch.
Compatibility: DOS, OS/2, Novell, Unix.

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STANDARD CONFIGURATION
Microprocessor: 80486 running at 25MHz.
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Storage: 125Mb IDE hard drive with 32K cache. 1.44Mb or 1.2Mb floppy disk drive.
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Expansion: 8 ISA expansion slots.
I/O Ports: 1 parallel and 2 serial ports.
Video: 14" VGA color monitor. 16-bit VGA color video adapter.
Keyboard: Enhanced 101 keyboard with tactile/click touch.
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Memory: 8Mb RAM (expands to 64Mb on system board).
Expansion: 8 32-bit EISA bus master.
I/O Ports: 2 parallel and 2 serial ports.
Video: 14" VGA monochrome monitor. VGA video adapter.
Keyboard: Enhanced 101 keyboard.
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In fact, the only regret you may have after you buy LANtastic is that you didn't install it last year, last month, even last week. Don't wait any longer. Call 602-293-6363 or fax 602-293-8065 and put the power of LANtastic to work for you.

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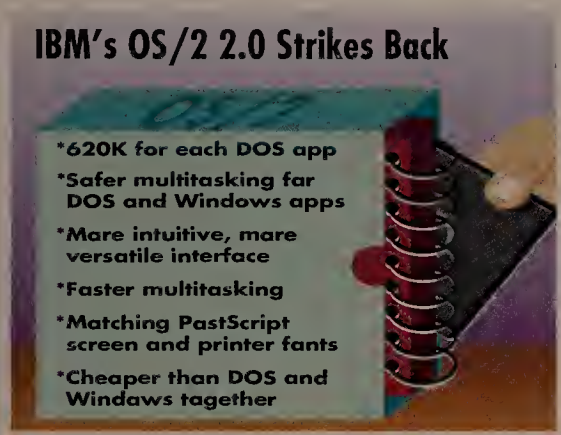
Circle 18 on reader service card

MIKE HOGAN

OS/2 Outdoes Windows

Runs Bigger DOS, Windows Apps Better

Struggling to regain leadership in system software after its split with Microsoft, IBM has launched a massive campaign for its OS/2 operating system—cutting current pricing to below DOS's, investing heavily in marketing and support programs, and promising a new version this fall with unexcelled support for DOS and *Windows* applications.



IBM's latest offers safer multitasking and performance advantages over Windows.

OS/2 2.0 will offer fast, 32-bit performance (Microsoft's upcoming *Windows 3.1* is still a 16-bit environment) and an upgraded user interface. And OS/2 2.0 multitasks DOS applications (giving each an impressive 620K of memory even with network and mouse support) and *Windows* apps with better protection against system crashes than *Windows* provides. IBM also claims to have solved nagging installation and printing problems.

Analysts caution that even with its performance advantages, OS/2 2.0 will have trouble beating *Windows'* huge momentum. Only 600,000 copies of OS/2 have sold to date, while *Windows 3.0* shipments have reached 4 million. And while corporate customers still invest heavily in in-house OS/2 projects, OS/2 application work has dwindled to a trickle among independent software vendors.

To further complicate matters, Microsoft plans to release late this year a software developers' kit for OS/2 3.0—not a follow-on to 2.0, but a built-from-scratch 32-bit alternative that will run DOS, *Windows*, and OS/2 packages.

OS/2 2.0 may not stop the *Windows* juggernaut, but IBM is doing what it needs to do for many corporate clients, notes Yankee Group analyst Paul Zagaeski. OS/2 2.0 will sell for under $200, with upgrades from IBM's DOS for $99 through year-end. (Pricing on OS/2 1.3 has dropped to $150, while DOS lists at $165.)

GORDON STUDER

Zenith Has First 386SL Notebook

During June, Zenith Data Systems will ship the first notebook PC using Intel's 386SL, a microprocessor with built-in power management. Zenith's $5500 MastersPort 386SL is a 6.8-pound notebook offering 3 hours of battery-powered computing you can use over days or weeks without exiting an application.

Because of Zenith's long experience with software-based power conservation, Intel sought its help in designing power management extensions right into the 386SL processor, says Intel marketing manager David Ryan. The 386SL's clock can be turned down to 0 MHz, compared to 2 to 8 MHz for the 20 MHz 386SX. The two-chip 386SL solution also takes up 40 percent less real estate on the system board than do comparable 386SX designs, letting system makers add more batteries, more storage, or better displays—or produce thinner or lighter systems. These characteristics will make the 386SL a must for pen-based systems, predicts Ryan.

A keystroke puts the MastersPort 386SL in "rest/resume" mode, where it can remain for up to three weeks, drawing a fraction of a percent of normal power—about as much as a keyboard's LED. A user could make a desktop presentation or unobtrusively take notes in a meeting, turning the computer "on and off" without rebooting.

Although the 386SL is now available in quantity, other vendors have been slow to announce. Dean McCarron, vice president at Instat, predicts several vendors will announce and sell about 120,000 systems this year, followed by 500,000 next year. The current reluctance, he explains, is due to the chip's relatively high price and vendors' desire to recoup their investments in the deluge of recent 386SXs.

AT&T Safari Lets Road Warriors Phone Home More Often

AT&T Computer Systems has introduced a high-end notebook PC with an emphasis on communications to let some 26 million out-of-office professionals stay out of the office longer without losing touch.

At 7.5 pounds, 9.5 by 12 inches, and a minimum sticker of $5399, the Safari NSX/20 is a little heavier, larger, and costlier than most of the breed. But those trade-offs yield a 10-inch diagonal VGA display, a full-sized, full-travel keyboard, and more memory and storage than average.

"One of most companies' expense reduction goals is to get sales professionals out of their $32-per-square-foot office buildings and have them function at home or in transit," explains Ed Coute, Safari general manager. To accomplish that, sales and service people, accountants, realtors, and software engineers need desktop functionality.

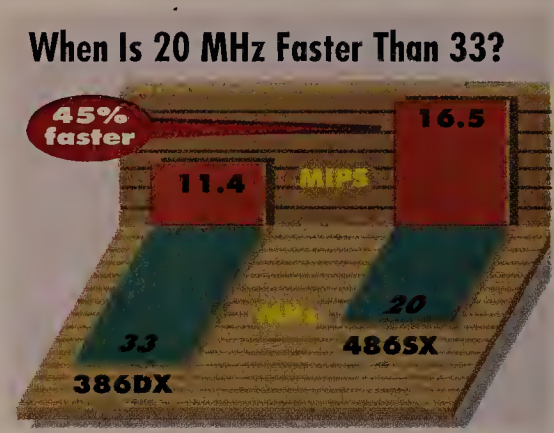
Standard features in the art deco–style Safari include twin batteries for up to 6 hours of computing between recharges, and a 2400-bps V.22bis modem with MNP-5 data compression and error correction for downloading files and E-mail through AT&T's EasyLink electronic mail network using the bundled *Access Plus* software.

AT&T also plans an internal 9600-bps data/fax modem for third quarter. By then, users should also be able to buy a plug-in wireless paging device for taking messages off the TeleFind global paging network and downloading them to the Safari. A cellular modem will offer still greater flexibility next year with wireless E-mail access.

"We don't want to have just another laptop," explains Ray Tringali, vice president in charge of reseller support. "We are trying to show that AT&T Computer Systems leads in communications."

Intel Shows Cheap 486

Hoping to move users more quickly from 386 to 486 computing and head off 386 clone makers, Intel is shipping a 20-MHz 486SX processor that offers about 45 percent more performance than a 33-MHz 386 for little or no price premium. The 486SX processor alone costs vendors $50 more than the $208 processor for the 386, but saves about $175 in other chips, so even early 486SX systems will be very competitively priced. One of the first, AST's $3695 Premium II 486SX/20, is actually less expensive than a comparably configured 33-MHz 386-based system.



Extensive integration makes a 20-MHz 486SX run about 45 percent faster than a 386/33.

Because 486s have more transistors and a higher level of component integration, they can process about twice as many instructions as 386s at the same clock speed, explains Intel product manager Frank Bryan. But the way Intel brings the 486SX to market is complex. The 486SX is fabricated as though it were a 20-MHz 486DX, but the math coprocessor is not enabled because Intel research shows that only 30 percent of computer users need one. This provides higher manufacturing yields and lets Intel price the chip lower than the $588 25-MHz 486DX.

Intel will also sell a 487SX-20 math coprocessor that at $799 is about $200 cheaper than the 33-MHz counterpart for the 386. The company asks vendors to include a coprocessor socket on their system boards, but because the 487SX-20 is nothing more than a regular 20-MHz 486DX with the coprocessor enabled, some vendors already are breaking ranks and creating one-socket designs. That could cut them off from unspecified future upgrades planned for this "performance socket," warns Bryan.

The strategy to move customers up is partly a defense against 386 clones, says Instat vice president Dean McCarron. "I think the 486SX will really take off," he adds. "It has the right name, the right level of performance and, most important, the right price." McCarron expects Intel to ship about 230,000 486SX processors this year and 1.1 million next year—about as many as the 25-MHz 486DX.

PC, Mini Vendors Work on RISC Design

Seeking to let PC users move up to higher-powered Reduced Instruction Set Computer (RISC) systems without abandoning their current software, Compaq, Microsoft, and 19 other major vendors are collaborating on a RISC standard that will run DOS, *Windows*, and UNIX programs.

The Advanced Computing Environment (ACE) group, whose annual revenues total a respectable $50 billion, is designing a computer architecture around MIPS Computer Systems' 64-bit R4000 processor. Its systems should arrive next year and run software atop either Microsoft's next-generation OS/2 3.0 or Santa Cruz Operation's UNIX-based Open Desktop. Apps written for either environment need only be recompiled to run on RISC machines or PCs.

With RISC machines monopolizing a workstation market that increasingly competes with high-end PCs, vendors such as Compaq are challenged to offer RISC options without abandoning PC standards. "Our customers have told us they want multiple choices, and they want these choices to interoperate with one another," says Compaq president Rod Canion. Since vendors don't know if the R4000 or Intel's upcoming 586 will predominate, "it's really important to have a common software base," adds Mike Perez, Compaq's director of systems engineering.

ACE membership includes Acer, NEC, Olivetti, SCO, Silicon Graphics, Zenith Data Systems, and DEC but not workstation heavyweights Hewlett-Packard, IBM, or Sun, which are deeply committed to their own RISC architectures. ACE could score big for Compaq, Microsoft, and others, but analysts are skeptical that a successful computer can be designed by a committee of competitors.

Borland Cashes In on OOP, Engine

Borland's investments in object-oriented programming (OOP) and a data base engine that is usable across its entire product line are finally reaping financial rewards and giving it a programming edge that could make it the first major company to offer a fully relational data base manager for *Windows*.

Borland showed an early version of *Paradox for Windows* at a recent developers' conference, displaying the ability to treat data as objects and vice versa. Separating the interface layer from the data engine could make data base applications easier to program, let users include graphics and even animation in record fields, and more easily access other data forms such as SQL data bases. Eventually, Borland's *Paradox, Object Vision, Quattro Pro,* and *Sidekick* will all access *Paradox Engine*–managed data more quickly and transparently via the *Windows* interface.

Borland's investments in this technology and last year's reorganization are letting it bring new products to market more quickly and more profitably, says Senior Vice President Spencer Leyton. Borland ended fiscal year 1991 on March 31 with a 127 percent increase in profits to $26.8 million on a 100 percent increase in revenues to $226.8 million.

That makes Borland the seventh-largest company on the just-released Soft-letter 100 list and gives it the cash to keep its products competitive with those of Lotus, Microsoft, and Ashton-Tate in markets those giants once owned.

Inside, Borland "just gets more done with fewer employees," notes Soft-letter publisher Jeffrey Tarter. Outside, he says, it cuts fat and stays close to customers with results-oriented direct sales. "They aren't wasting a lot of dollars massaging semicompetent dealers."

Borland is now working with Novell to enable its *Windows* front-end products to seamlessly access BTrieve and SQL data in NetWare.

GORDON STUDER

The Hottest Value
In The Industry
Just Got Even Hotter!

INTRODUCING THE NEW G

NEW MINI DESKTOP 286 AND 386SX MODELS ARE BIG ON PERFORMANCE!

Sometimes the best things come in small packages. This saying definitely applies to Gateway 2000's spunky little 286 and 386SX computers. These systems now come in a space-saving mini desktop model that's sizzling with powerful new features.

The motherboard in the 286 and 386SX systems was custom-designed and manufactured for Gateway 2000 using ASICs (Application Specific Integrated Circuits) to create a cleaner, more reliable board. We integrated the floppy drive controller, the video chip set and the I/O card on the motherboard, to leave five 16-bit slots open in the standard configuration.

The Gateway 2000 286 system operates at 16 MHz, rather than 12 MHz, for better performance. Our 386SX is available as a 16 MHz or a 20 MHz system. The 386SX-20 includes a 32K cache, which makes this system another truly outstanding Gateway price/performer.

HOT-PERFORMANCE 386 AND 486 SYSTEMS ARE IN ICY GRAY, CURVILINEAR MODELS

Although Gateway's 386 and 486 systems look entirely new, we limited changes on the inside to fine-tuning performance and reliability. In the Midwest, we firmly believe in the adage, "If it ain't broke, don't fix it." And these award-winning, price/performance systems did not need fixing.

All 386 and 486 systems include a fast and reliable IDE (Integrated Drive Electronics) hard drive with built-in cache. For added reliability and lower RF emissions, we've incorporated ASICs in the design of our motherboards whenever the change improved cost/performance. Because our 386 and 486 computers already include the fastest, most reliable video card on the market, the only way we could improve video performance was to increase the size of video RAM. So we did. All Gateway 2000 386 and 486 systems come standard with 1 MB video RAM. We also made our new Crystal Scan 1024NI color monitor standard with these systems. The 1024NI is non-interlaced, giving you a flicker-free video display with up to 1024 x 768 resolution.

INTRODUCING THE AWESOME ANYKEY™

We call our new 124-key programmable keyboard the AnyKey because any key can be programmed to perform any function – anything you can imagine, quickly and easily. Or you can remap the keys to create your own keyboard layout. It's a revolutionary new concept designed to let you talk to your personal computer in a very personal way.

GATEWAY 2000 COMPUTERS

The AnyKey includes a numeric pad and a separate, full-function cursor pad with diagonal keys, plus two sets of function keys located along the top and left side.

The Anykey's versatility is rivaled only by its simplicity. You can learn to program it in just a few minutes. If you goof, you can easily reset the keyboard to a normal configuration. And if you hate the idea of programming anything, you'll still love the feel and extra keys on the AnyKey. The AnyKey keyboard is an option with all Gateway 2000 computer systems.

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We've also expanded our telephone technical support hours to provide you with even more flexibility and better service. We're here to help you from 6 a.m. to midnight weekdays and 9 a.m. to 2 p.m. Saturdays.

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Possibly the most dramatic news about our new product line is price. When a manufacturer introduces a new product line, you expect to see an eruption of price hikes. But then you've come to know Gateway is not like most manufacturers. Prices on systems in our new line are better than ever. And that goes for quality and service too, making the hottest value in the industry even hotter.

LOOKING AHEAD

The introduction of our new product line represents almost a year of design and engineering. But it's just one phase in a process of continuous improvement that we employ at Gateway. Each day, Gateway 2000 employees come to work with one primary goal in mind: to provide you with better prices, performance, quality and service. We're committed to making Gateway 2000 the only logical choice in microcomputers.

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- Intel 80386 Processor
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- 1 Parallel/2 Serial Ports
- 101 Key Keyboard
- Microsoft Mouse
- MS DOS 3.3 or 4.01
- MS Windows 3.0

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33MHZ 486 CACHE

- Intel 80486 Processor with Co-Pro and 8K Internal Cache
- 64K Cache RAM
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- 1.44 MB 3.5" Drive
- 200 MB 17ms IDE Drive with 64K Multi-Segmented Cache
- 16-Bit VGA with 1 MB
- 14" Crystal Scan 1024NI Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 101 Key Keyboard
- Microsoft Mouse
- MS DOS 3.3 or 4.01
- MS Windows 3.0

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FRED STIMSON

Microsoft's Choice

Microsoft is in trouble with IBM, Apple, software developers, and the United States government. Is this any way for a standard-setter to live?

If you've been watching lately, you know it's been good news/bad news time over at Microsoft. First the good news: The software giant scored sales of almost $500 million in the first quarter of 1991, making it more than twice the size of Lotus, its largest competitor.

Now the bad news: Microsoft's marriage with IBM has hit the rocks, the lawsuit with Apple over *Windows* copyrights took a turn for the worse, the Federal Trade Commission is investigating Microsoft's business practices, and software developers are steaming over the company's *Windows* application advantage.

What's wrong with this picture? By aggressively expanding the PC market with DOS, *Windows*, languages, and applications, Microsoft has helped to create enormous opportunities for hardware and software vendors while providing unprecedented freedom of choice for users. Lotus now stands to make about $800 million in revenues in 1991 and WordPerfect will make about $500 million. Apple is number one in personal computer sales, ahead of IBM, thanks in part to applications like *Microsoft Excel*, *Word*, and *Works*. And the IBM PC–compatible world itself is now over 60 million strong and still growing.

Hardball, Redmond Style

If software vendors don't seem appreciative, it's because they don't like the way Microsoft has parlayed its standard-setting role in operating systems into incredible success in applications. At an estimated $1 billion this year, Microsoft's application sales alone are enough to qualify it as the biggest PC software vendor in history, surpassing Lotus, WordPerfect, and everybody else. Numerous software developers privately complain that Microsoft grew to this size by passing important information between its operating system and applications groups before circulating it among other vendors, especially where *Windows* is concerned. As a result, Microsoft is the only major vendor with a full suite of *Windows* software already in users' hands.

Meanwhile, IBM is mad at Microsoft for putting its weight behind the DOS-*Windows* combination rather than focusing on OS/2. And it's a safe bet that Apple's not happy with the latest *Windows* sales figures, which show the environment already outstripping the Macintosh in number of users.

In contrast, Microsoft points out that interchange between the company's applications and operating system groups is responsible for major *Windows* innovations like object linking and embedding (OLE). *Windows* is a success story not because Microsoft failed to support OS/2—the company has more OS/2 applications than any other PC vendor—but rather because users gave *Windows* an overwhelmingly enthusiastic reception in comparison to the lame response they gave to OS/2. And *Windows*-Macintosh compatibility only serves to boost the Mac as a mainstream business machine.

The Best Solution: Split the Difference?

As a solution to this impasse, many software developers privately favor a government order to split Microsoft's applications and operating system divisions into separate companies. The two new companies would each still tower over the PC industry, but at least Microsoft's competitors in the application arena could expect equitable treatment from their new operating system vendor. Few observers think the FTC will ultimately order such a drastic action, however.

But if that's all it takes to put Microsoft's competitors more at ease with the industry giant, then the company can take steps today to smooth relations with the rest of the PC world. Witness Compaq: Its EISA consortium brought competitors together to challenge IBM for control of the next-generation PC standard, and the group held together because it functioned like a full-fledged standards organization. Microsoft could adopt the same policy with *Windows* and OS/2, opening up its development program to the software community at large for comments, improvements, and

(continues)

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collaborative effort, while keeping its application side at bay until new operating system standards became available to all.

We expect 1991 to continue to be a banner year for Microsoft: DOS 5.0 promises to be the most popular upgrade the operating system has ever undergone; *Windows 3.1* will work out most of the kinks of the earlier version and deliver some important new capabilities to boot; most important PC vendors will deliver *Windows* versions of their products; and Microsoft will take advantage of this software wave to launch new and upgraded packages itself. As the industry's de facto leader, it should also take the opportunity to change the nature of its competitive relationships. That's the only way Microsoft can ensure that *Windows* will become the same broad, user-driven standard that DOS is today.

As always, I'm interested in your opinions on this or any other subject. Write to me at *PC World*, 501 Second St. #600, San Francisco, CA 94107; fax 415/442-1891; MCI Mail Richard Landry/301-3685.

POWER TIP NO. 185

DisplayWrite Text Searches With Norton Utilities

DisplayWrite uses the EBCDIC coding scheme for storing data rather than the ASCII standard used by most DOS applications. This makes *DisplayWrite* document files impenetrable to most text search programs. To search *DisplayWrite* files for text with *Norton Utilities 4.5*'s Text Search program (TS.EXE), use the /EBCDIC extension, as in **ts** ***.doc** *"text to search for"* **/ebcdic**.

Freda Miller
Berkeley, California

"THE MOST POWERFUL COMPUTERS ARE THE ONES PEOPLE ACTUALLY USE."

—Apple Computer

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Painstakingly engineered with you clearly in mind, the T2000SX will help you work more efficiently than ever before.

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Our technologically superior battery can be fully recharged in a mere ninety minutes.

find on the T2000SX: An 80386™SX processor with a math coprocessor socket, VGA compatible display, 1 MB (expandable to 9MB) of 80 nsec RAM, a 40 MB hard disk with 19 msec access time and 1.5 MB/sec data transfer rate.

The T2000SX has a 40MB hard disk with 19 msec access time.

But more important than the specs themselves, is the way the T2000SX lets you use them. Which is more often.

Our fluorescent side-lit screen provides even distribution of light. (Actual size.)

Welcome to the next generation in personal computing.

Because the T2000SX can fit easily into a briefcase (it weighs a scant 6.9 pounds), you can take it anywhere you go and use it in more ways than you can imagine.

Need to make revisions to a

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Our internal AutoResume back up battery automatically saves your work if your main battery runs out.

business proposal? The T2000SX gives you the freedom to do it from a train. The client wants an estimate on costs? You can give it to him right then and there—wherever there is.

No more wasting time running back to the office. Because the office is always with you.

But just in case there's something back at the office you still need, you can get back to it with our optional built-in modem. Which supports industry standard error corrections and data compression (CCITT V.42, V.42bis, MNP® 5). It even supports cellular data communications via our optional smart cable adapter.

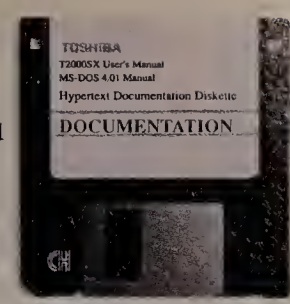
Our user-installed memory card allows you to add up to 8 MB of memory yourself.

The T2000SX also has a unique feature you won't find on any other computer in the world. It is called AutoResume.

AutoResume: Think of it as a bookmark for your computer.

AutoResume automatically saves whatever you're working on whenever you turn the computer off. And it lets you go directly to the program you were using last when you're ready to start up again. So you don't have to reboot, restart your application and reload your files.

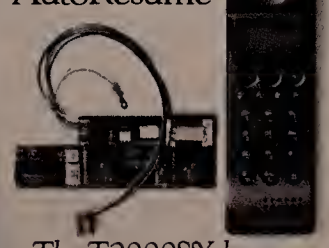
AutoResume also helps save on battery life and it allows you to change batteries without losing an ounce of information.



The T2000SX comes complete with Hypertext on-line documentation.

As for batteries, the T2000SX touts the latest in battery technology—Nickel Hydride. Nickel Hydride delivers 22% more watt-hours per pound than NiCad and it doesn't suffer from memory effect.

In keeping with the Toshiba tradition, the T2000SX also offers superior ergonomics. Like full-size, standard-spaced keys on a keyboard which has a full set of 12 dedicated function and 8 cursor control keys. And a VGA compatible, reversible black on white or white on black high resolution display.



The T2000SX has an optional modem that allows data communications via a cellular phone.

Okay, let's wrap this thing up.

These are just a few of the reasons why we believe the T2000SX is the most useful, and therefore, most powerful computer in the world. And why P.C. Week* Labs said, *"the T2000SX offers performance comparable to the LTE 386s/20, plus many of the design features that have made Toshiba a market leader in portable PCs."*

PC WEEK

We invite you to learn more about the T2000SX and Toshiba's best-selling line of portable computers by calling us at **1-800-457-7777** for a complete information kit.

In closing, we'd like to thank you for reading our ad.

We'd also like to thank our friends at Apple for giving us such a wonderful endorsement.

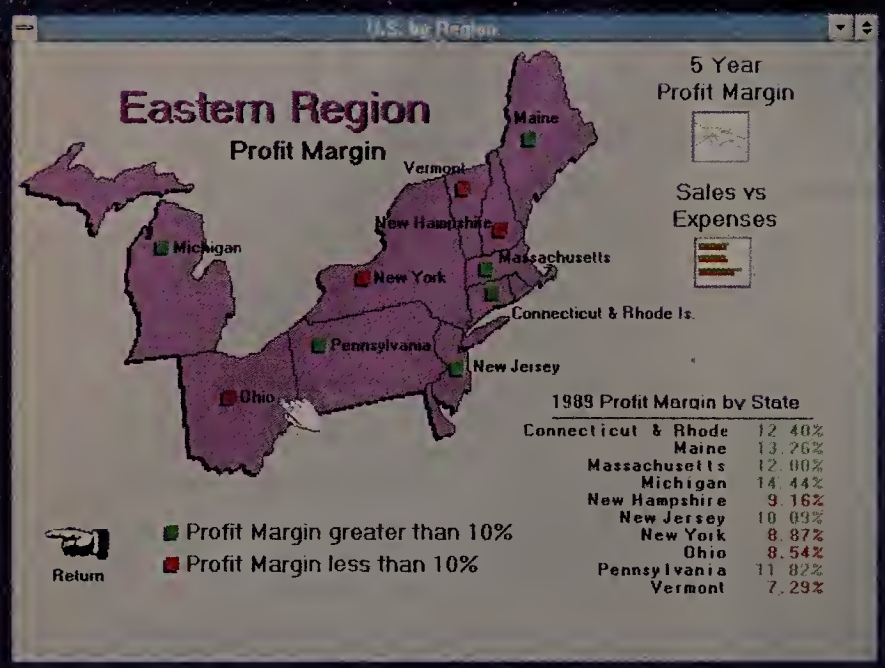
In Touch with Tomorrow

TOSHIBA

Circle 257 on reader service card

Will You Stay On Course In Today's Ocean Of Information?

Navigate Through Information With LIGHTSHIP, The Data-Driven™ Windows EIS



The right information can guide you through rocky business waters. LightShip,™ the Windows 3.0-based executive information system (EIS), brings that information to you in a graphical, easy-to-understand format. Imagine seeing exceptions for each sales region every day. Or detecting production and shipping bottlenecks before they occur. LightShip can bring you the business information you need in colorful screens of charts, tables, graphs, and images.

But LightShip isn't merely fixed reports or pretty pictures. It is dynamic information based on Data-Driven™ hot spots that link your PC to real-time information in spread-sheets, database files, text files, even images. And that information can reside on your PC, LAN server, mini, mainframe, or in external sources, which means you can put LightShip to work today in your existing environment, without a major investment.

With its codeless, visual programming environment, LightShip EIS development is fast and easy, using simple point-and-click operations. Data-Driven hot spots mean those applications are flexible and self-maintaining. LightShip applications can access and present thousands of screens of information without redundant multi-screen programming and time-consuming maintenance.

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Circle 216 on reader service card

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PILOT
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LETTERS

Reactions and responses from the PC World community

RANDY LYHUS

486s: Raising Your Rates?

Alice LaPlante's March "Pro vs. Con: Are You Ready for a 486?" [the follow-on story to "33-MHz 486s: Ultimate PC Power"] really caught my eye. As an information systems VP and a personal customer of Southern California Gas, I was outraged by the "buy-too-much" attitude of their systems evaluation manager, Bob Holmes. Let's be realistic. In private business we have to be patient and slug it out with existing equipment. Most of us are just trying to make it through the recession without major equipment failures. Utility companies have the advantage over the rest of us with their guaranteed, noncompetitive market. If my business had that kind of locked-in profit, I'd probably have that "Full speed ahead—buy those 486s" attitude too!

Pete Mc Kenney
Manhattan Beach, California

Two Scents Worth

Joe Guyette's reaction to a rose-scented ad [*Letters*, March 1991], is off base. If you follow his suggestion and substitute after-shave for the rose fragrance, just think of all the women who'll have to explain *that* scent to their husbands. Many women subscribe to and read *PC World*. Welcome to the nineties, gentlemen!

Joy L. Thompson
Los Lunas, New Mexico

No Longer Down, Down Under

Thank you, thank you, for the improvement in distribution in Australia. We received the February issue on January 24. In the past, we'd have received it sometime in March, if we were lucky. We often feel neglected down under. This is a real boost to our ego!

J. Miles
Baulkham Hills, Australia

SX Versus DX

I'm becoming confused by all the numbers and letters used to designate computer CPUs these days. For instance, your February review "Value Alert! 20-MHz 386SX Systems" suggests that we bypass 16-MHz SXs in favor of 20-MHz SXs. But what does either of these chips offer in comparison to the regular 386? And is there a difference between a 386 and a 386DX?

J. Hugh Currie
Lower Sackville, Nova Scotia
Canada

Simply put, 386DX *is the correct name for the full 386 chip. The* 386SX *is like a 386 on the inside and a 286 on the outside. Its smaller size makes it much less expensive to manufacture, and because of its outer similarities to the 286, the SX is a snap to design into systems based on existing AT architecture. Although the SX duplicates the internal functioning of a DX of comparable speed, overall system performance slows because the SX passes data to and from memory 16 bits at a time compared to the full 386's 32 bits. And the SX, like the 286, handles only 16MB of RAM, which is 1/256 the capability of its big brother DX.—Ed.*

Watching Prodigy

I'd like to add to the February *Consumer Watch* comments on Prodigy. I tried the service when it was first offered but quit because of the 5-minute log-on and Prodigy's low level of support for my hardware configuration. It takes me less than a minute to log on to GEnie or CompuServe, and I can access either service or MCI Mail from my Commodore 128 at home. But Prodigy's proprietary software is not available for Commodore. Graphics are nice, but not at the sacrifice of speed. Let Prodigy conform to computer communications standards or die a natural death.

Kenneth Bush
Indianapolis, Indiana

You Can't Wait Forever!

I do nightly unattended long-distance file transfers, and I just had to respond to "Waiting Forever With Procomm" on page 217 in the February issue. The advice to insert "forever" as an alternative parameter in the WAITFOR command

(continues)

ANTHONY RUSSO

sounds like a good way to rack up a horrendous CompuServe bill. For instance, if there's line noise, the script may never read the target string—and there you'll be, waiting *forever* on line! If the default 30 seconds isn't long enough, specify another number that is. Then, to save phone and on-line charges, you can build in error loops with the IF command to ensure that your scripts go as planned or get aborted.

Tom McCaughey
Nikiski, Alaska

Great-Looking Dot Matrix Output

Your January "Easy Fonts for Great-Looking Documents" was excellent, and we gleaned a lot of much-needed information about expanding our font options. But let's set the record straight about the quality of output available from dot matrix printers. Our Fujitsu 24-pin dot matrix color graphics printer produces output of much better quality than any of the dot matrix examples shown in your article. In fact, it approaches the quality of the LaserJet and DeskJet with certain fonts.

June Windblad
Loring Windblad
Westminster, British Columbia
Canada

A Perfect Word Processor?

I read "Perfect Mail Merges for Mass Marketing" in March, and I wish someone would explain to me what makes *WordPerfect* so popular. Any secretary required to use the program should be paid an extra $5000 a year. I can compose a *Word* form letter with straight typing—no need to burrow repeatedly into the roots of a menu tree or punch up a series of finger-bending function-key combinations. "Create mass mailings quickly" with *WordPerfect?* Do people really go through all that to create a form letter?

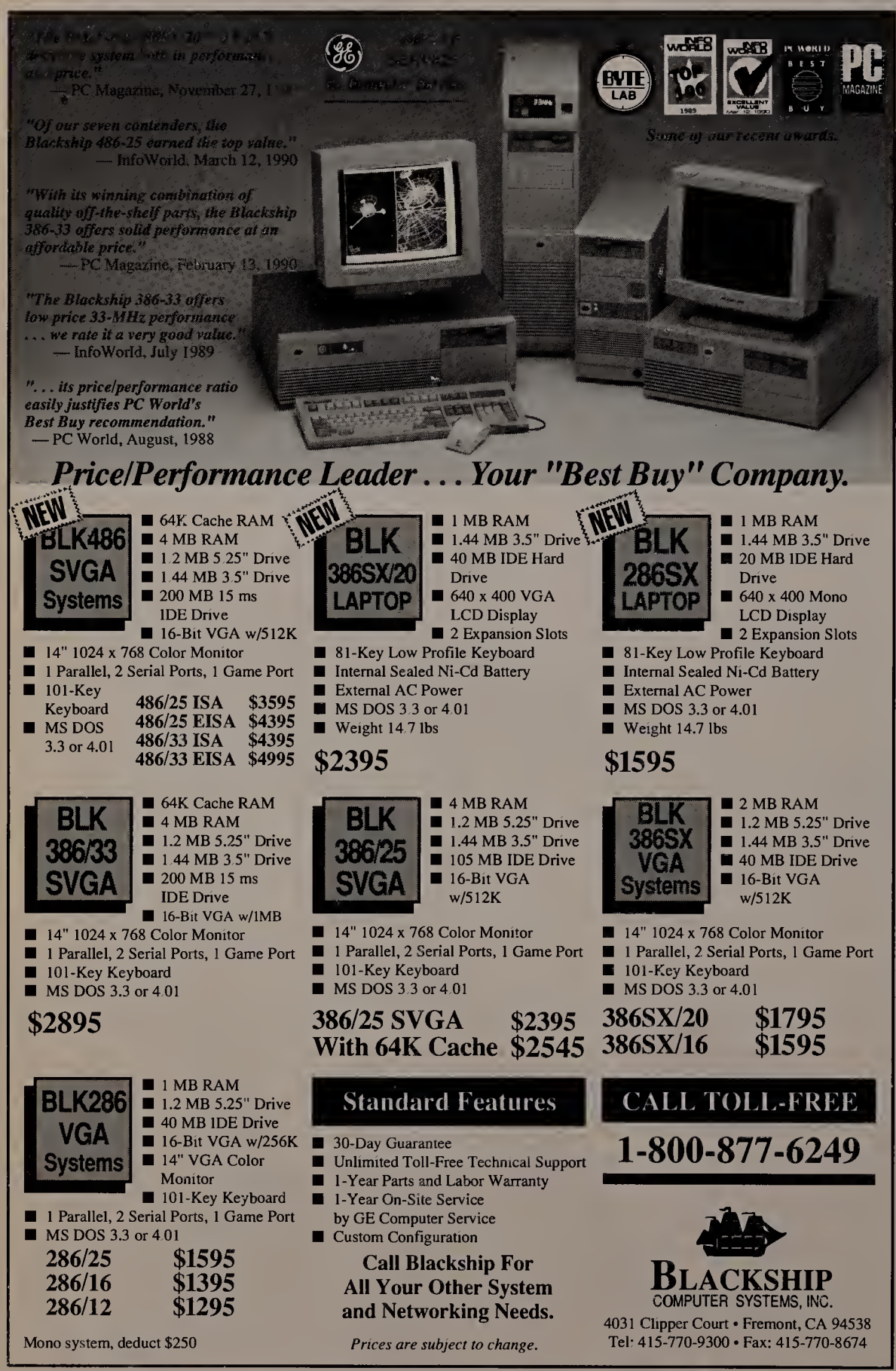
Richard Zigler
Marion, Michigan

I give up. It seems that as far as you're concerned, there's only one word processor—*WordPerfect.* I've been using *WordStar* for four years up to version 5.5. It may not be the most user-friendly program, but I've learned to live with it. I can't remember a recent issue where you featured *WordStar* tips.

Arnold Beichman
Stanford, California

We have to be responsive to the majority of our readers, who use WordPerfect. *But don't think we've forgotten about other word processing favorites. We regularly run* Power Tips *and* User Group Tips *for a wide range of word processors. For example, the first of this month's* User Group Tips *is de-*

(continues)



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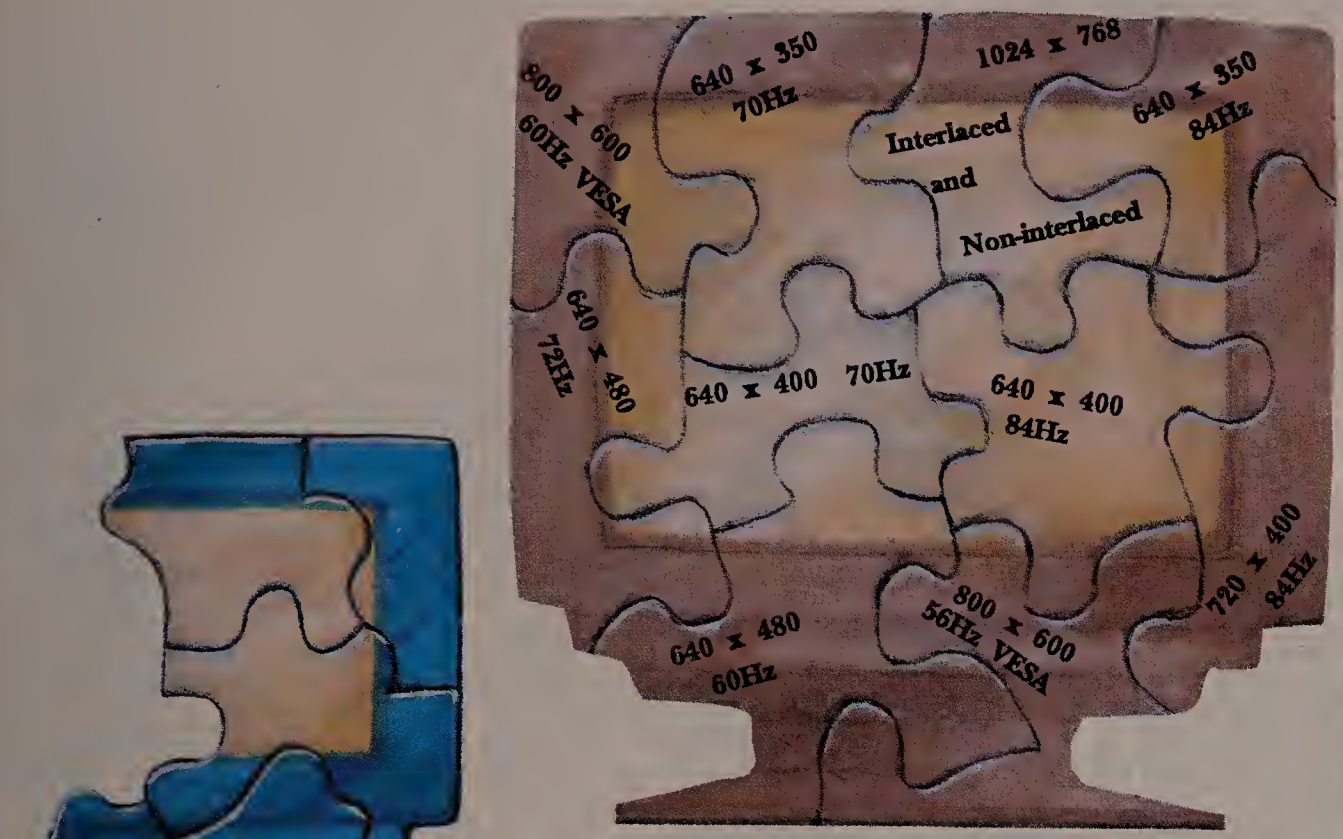

We put all the pieces together.

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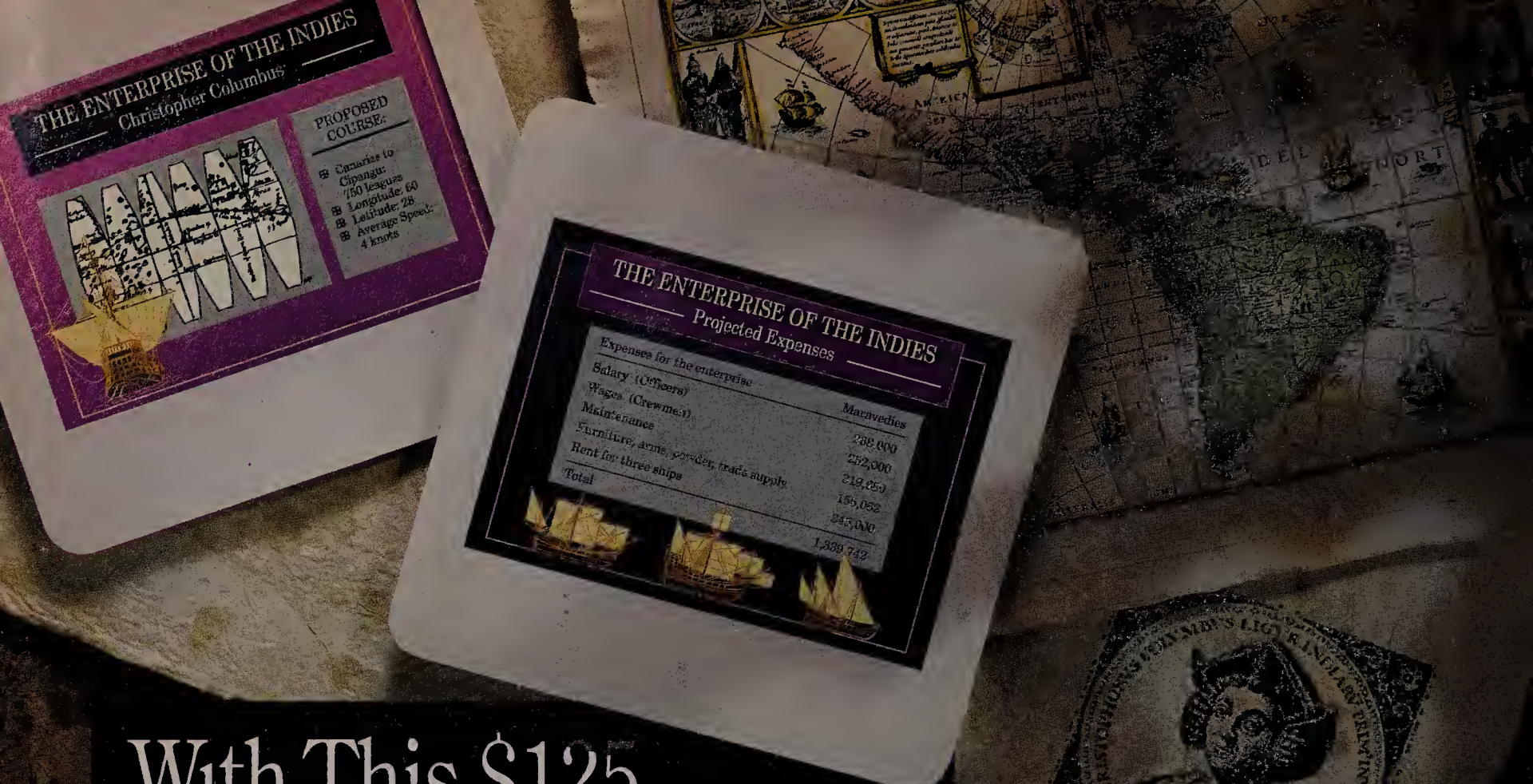

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Jun. 11, 1990

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voted to our readers who use WordStar. *Check it out for a quick way to convert your* WordStar *files for use with any word processor. —Ed.*

World Class Accounting

I think you did well to explain the accounting and personal finance categories on this March's *World Class Ballot.* But as far as I'm concerned, you should go a step further and split the accounting class into two groups. All-in-one programs, such as *DacEasy,* contain General Ledger (GL), Accounts Receivable (AR), and Accounts Payable (AP) in one integrated program, but they provide only basic reports. Modular programs, on the other hand, like *Great Plains Accounting Series* or *Accpac Plus,* have a central GL that integrates with separate AR, AP, Inventory, or Payroll modules. These programs have multiuser capabilities, provide extensive standard reports, and have custom report generators.

Jody Braaten
Great Plains Software
Fargo, North Dakota

A Low Cost for High Speed

Your article on 9600-bps modems in February ["Users Turn Toward Higher-Speed Modems," *Industry Outlook*] is enjoyable and timely, but I'd like to point out one error. You contrast the U.S. Robotics internal Courier V.32 modem, which lists for $895, with the $1199 Hayes Ultra 96 incorporating V.42 and V.42bis and imply that you have to pay more for these added features. Actually, the fully featured Courier V.32 also incorporates these protocols. We use our own chip technology employing off-the-shelf microprocessors to keep costs down. As a result of our high quality and low prices, CompuServe has selected our modem for its 9600-bps service. If people pay more for the Hayes modem, it's not because of features or performance.

Jonathan Zakin
U.S. Robotics
Skokie, Illinois

Corrections and Clarifications

"A Little Bit More" in April's *User Group Tips* contains a serious error. If you type the command **more** > *filename* to list a file on screen, you will overwrite the file you are trying to view. The correct command is **more** < *filename. PC World* regrets the error.

Our March "Perfect Mail Merges for Mass Marketing" has an error on page 218. We instructed you to enter a marker for the Last-Order field by pressing <**F7**><**Backspace**>. Actually, you should press <**F7**><**Cursor Left**> to get back to the editing screen and inside the IF statement.

Our Features Evaluation in April's

(continues)

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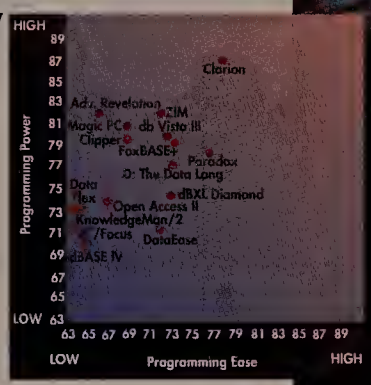

Here's what American corporations in a PC Week survey thought of the power and ease of use of Professional Developer vs. competitors.

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for the HP LaserJet II, IID, III and IIID

"The ServerJet is the smoothest and most practical way I know to share a LaserJet." Frank J. Derfler, Editor PC Magazine, 1/15/91

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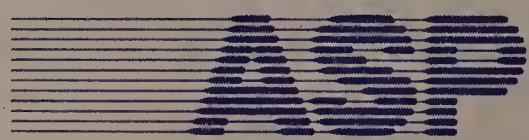

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"33-MHz 386s: Survival of the Fastest" erroneously reported the AT&T 6386/33 WGS's coprocessor support. The AT&T does support the Weitek 3167.

Our April communications review "Easier Tools for the On-Line World" mentioned a mail-order price for *Procomm Plus 2.0* that didn't reflect the cost increase of this upgraded version. Purchasers are likely to find mail-order prices ranging from $65 to $80 for version 2.0. *PC World* regrets any confusion this error may have created.

Send your reactions, responses, and ideas to Letters, PC World, *501 Second St. #600, San Francisco, CA 94107; CompuServe 74055,412; MCI Mail PC World Editorial; or 415/442-1891 (fax). Include your name, the name of your city and state, and your phone number. We reserve the right to edit letters.*

POWER TIP NO. 179

Revealing Tab Settings in WordPerfect

If you frequently change tab settings in *WordPerfect,* you probably want to be able to see your settings. You can display tab set indicators in *WordPerfect 4.2* and later versions using either Reveal Codes (<Alt>-<F3>) or Window (<Ctrl>-<F3>1#, where # is the number of lines to view). A 25-line display actually shows 24 lines because of the status line, so entering **<Ctrl>-<F3> W23** places the window divider at the bottom of the screen. This allows you to view the document in a nearly full edit screen but still see the tab sets.

Charles R. Bovell
Hixson, Tennessee

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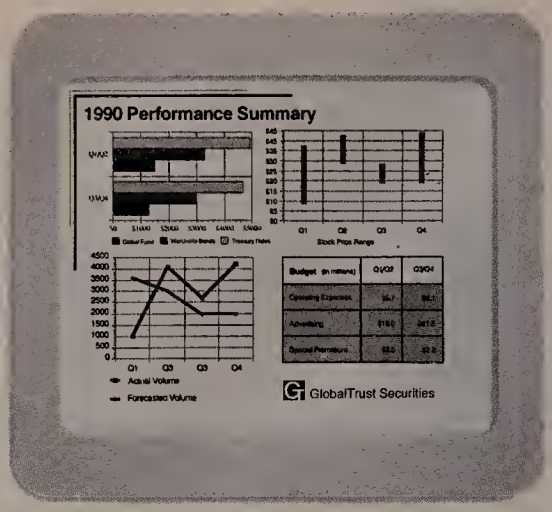

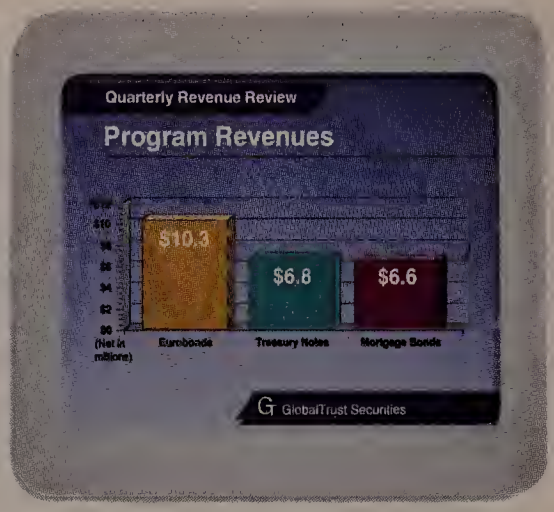

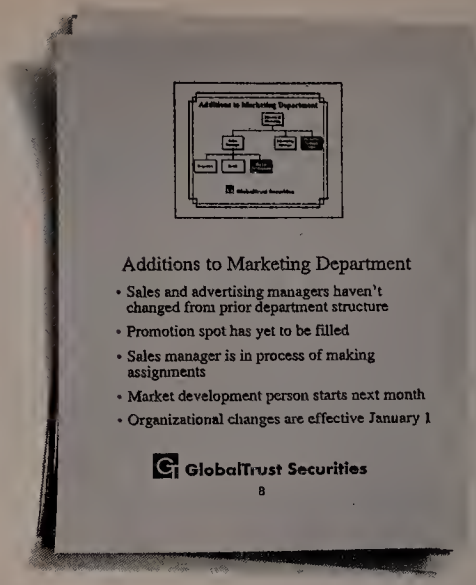

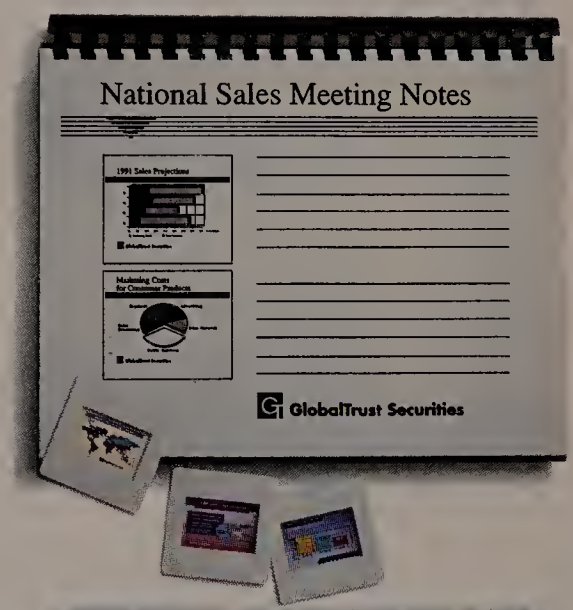

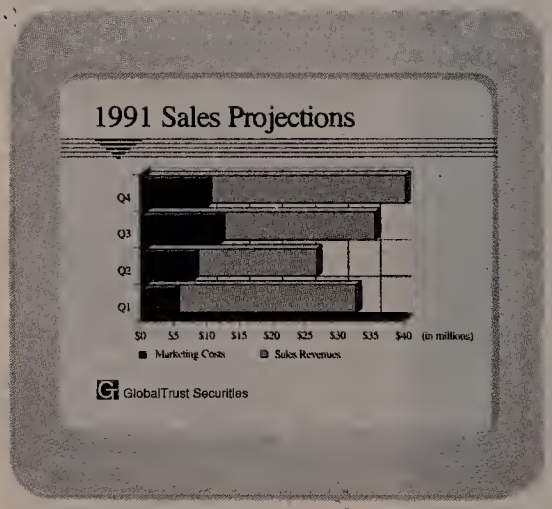

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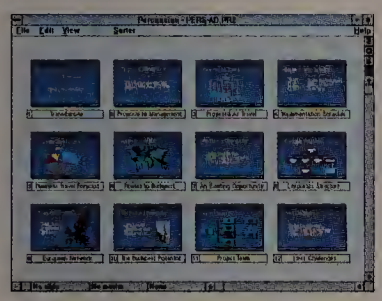

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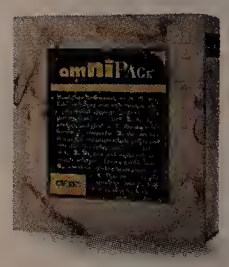

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THE HELP SCREEN

PC World offers answers and advice at every level

Adjust the volume of your computer's speaker, learn what to do with CHKDSK's files, install three floppy drives, build bibliographies in any word processor, teach your XT to tell time, and minimize the network traffic WordPerfect users generate.

Karl Koessel and Robert Lauriston

Quiet on the Set

Q. *I'm irritated by beeps and other sounds from my IBM PS/2 Model 30, particularly when the machine starts up but also when I'm running applications. Is there a utility that can silence the beep, or can I disconnect the speaker cable inside the computer? (I looked but couldn't find the speaker.)*

Shinya Shima
Ota-ku, Japan

A. Software can't silence your system during start-up because you can't run it until after the system has started. Furthermore, shareware and public domain utilities that can turn off the speaker won't do you much good, because most programs just turn it back on. The only reliable solution is to break the connection to the speaker. On the Model 30, the speaker is a silver cylinder about ½ inch in diameter and ½ inch high with a small hole in the top. It's mounted directly onto the motherboard at the front left corner, right behind the IBM logo. You can break it off the motherboard, but you probably won't be able to replace it.

On other PS/2 models, you can mute the system by cutting the small metal tab that connects the speaker to a plug-in assembly (which also holds the system's CMOS battery). Silencing the speaker on standard PC/XT/AT systems isn't as drastic an operation: Just pull the speaker wires' connector off its pins on the motherboard or cut one of the wires. In either case, soldering a potentiometer volume control (plus, optionally, an earphone jack) across the broken connection would let you adjust the speaker to a comfortable level or run noisy programs without distracting others in your office. Note that semiconductors can be damaged by heat, so be very careful when soldering inside your system.

CHKDSK's Files

Q. *I've been taught to run the DOS command CHKDSK /F periodically to ensure the integrity of the files on the hard disk. But what do I do with the lost cluster files that I find in the root directory after running the command? How do I figure out where they came from, and how do I put them back?*

Bryan Kimsey
Los Alamos, New Mexico

A. CHKDSK doesn't exactly create the FILE*xxxx*.CHK files. It simply finds clusters that the file allocation table shows as being in use but that aren't assigned to a file, and adds a directory entry file name to assign them to. Often, the data in such clusters no longer has a place in which it belongs, as is the case when through some software error, clusters holding parts of an application's temporary files, or of deleted files, are marked incorrectly as being in use.

Very rarely, a lost cluster holds part of an application, rendering the application inoperable. However, applications are easily restored or reinstalled. Real trouble surfaces when a lost cluster holds lost data. Unless that data is ASCII text, it's virtually impossible to determine which file it belongs to, much less merge it back in. But if you don't restore that file, your next backup will include a deficient version. So although you can generally erase the CHK files without concern, you should also verify the validity of all valuable data files, restoring them if necessary.

Three Floppy Drives

Q. *I've got two 5¼-inch floppy drives and a 65MB hard disk (partitioned into two logical drives) in my AT compatible. I'd like to add a third, 3½-inch, floppy drive. I know there are controllers that can handle four floppy drives. My question is, can I keep my drive letter assignments the same—A: and B: for my current floppy drives, C: and D: for the hard disk—and designate the new drive E:?*

J. E. Brendtke
Port Richey, Florida

A. With most multidrive controllers, you can. Just check with the board's manufacturer before you buy. One other

(continues)

ANTHONY RUSSO

thing to keep in mind is that most power supplies have only four power connectors. If yours is typical, you'll need a "splitter" to let you plug power into the new drive. Note also that unless the controller comes with software to modify DOS 2.*x*, you need DOS 3.2 or a later version to use a 720K drive, and DOS 3.3 or a later version for a 1.44MB drive.

For the utmost in compatibility, check out CompatiCard from Micro Solutions. This four-floppy controller includes its own ROM routines to support a variety of floppy drive formats and has switches to change interrupt levels and I/O addresses in case the card's default settings conflict with other devices in your system. You can even boot from any of the drives.

WHERE TO BUY

CompatiCard
Micro Solutions Computer Products
132 W. Lincoln Hwy.
DeKalb, Illinois 60115
815/756-3411, 815/756-2928 (fax)

LIST PRICE: $95 for II, $149 for IV
Reader service no. 640

Endnotes as Bibliography

Q. *As an assistant professor of veterinary anesthesiology, I write scientific research articles. My word processor's endnote feature just isn't up to the job of producing my bibliographies in the format required by the* American Journal of Veterinary Research. *For instance, it won't let multiple notes in text reference the same endnote. This means I have to spend a lot of time manually reformatting before I can submit my article for publication. Is there a way to make my computer do these things?*

Ron E. Mandsager
Stillwater, Oklahoma

A. Regardless of what word processing program you use, endnotes aren't appropriate for producing a bibliography. Most word processors won't produce bibliographies automatically. One that will is Dragonfly Software's *Nota Bene.*

An easier option than switching word processors is the bibliography version of *Notebook II* from Pro/Tem Software, a text-oriented data base that stores your references. Instead of marking the references with endnotes in your word processing document, you use special *Notebook* tags. When you're ready to print, you run your word processing document through *Notebook*'s Bibliography utility, which puts the references in correct format and appends the properly formatted bibliography. Pro/Tem includes templates for bibliographies as defined by the four most popular academic style manuals; templates for several hundred journals requiring other formats are available from third parties.

Another alternative is *Endnote,* a similar program that has been popular on the Macintosh and was recently ported to DOS.

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3790 El Camino Real #389
Palo Alto, CA 94306
800/533-6922
LIST PRICE: $264 with bibliography ($189 for standard version)
Reader service no. 641

Endnote
Niles & Associates
2000 Hearst St.
Berkeley, CA 94709
415/655-6666, 415/649-8179 (fax)
LIST PRICE: $149
Reader service no. 642

Lost Time

Q. *My system used to set the date and time automatically. But ever since I upgraded to DOS 3.3 from the DOS 2.11 that came with my XT compatible, I've had to enter the date and time manually every time I start the system. How can I access the internal clock?*

Harry L. DeShaies
Colorado Springs, Colorado

A. Because your system isn't an AT compatible, you must run a special utility that reads the date and time from a clock on an expansion board and then sets the system clock. If you can't find CLOCK.COM, SETCLOCK.COM, or a similarly named utility on your hard disk, look on the disks that came with the system or with a clock/calendar upgrade board. Copy the utility to your hard disk's DOS directory, and add the command to AUTOEXEC.BAT.

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Karl Koessel is the technical editor and Robert Lauriston a contributing editor for PC World.

POWER TIP NO. 180

Importing 1-2-3 Worksheets in WordStar

If you use *WordStar Professional 5.0* or a later version, it's easy to import *1-2-3* worksheets. With a *WordStar* document open, press <Ctrl>-KR, and type the path and name of the WK1 file you wish to view, edit, or print. You can either specify the worksheet range or press <Enter> to accept the whole worksheet. To print the worksheet, adjust the margins, and print it as you would any text.

Michael Goodwin
Associate Editor

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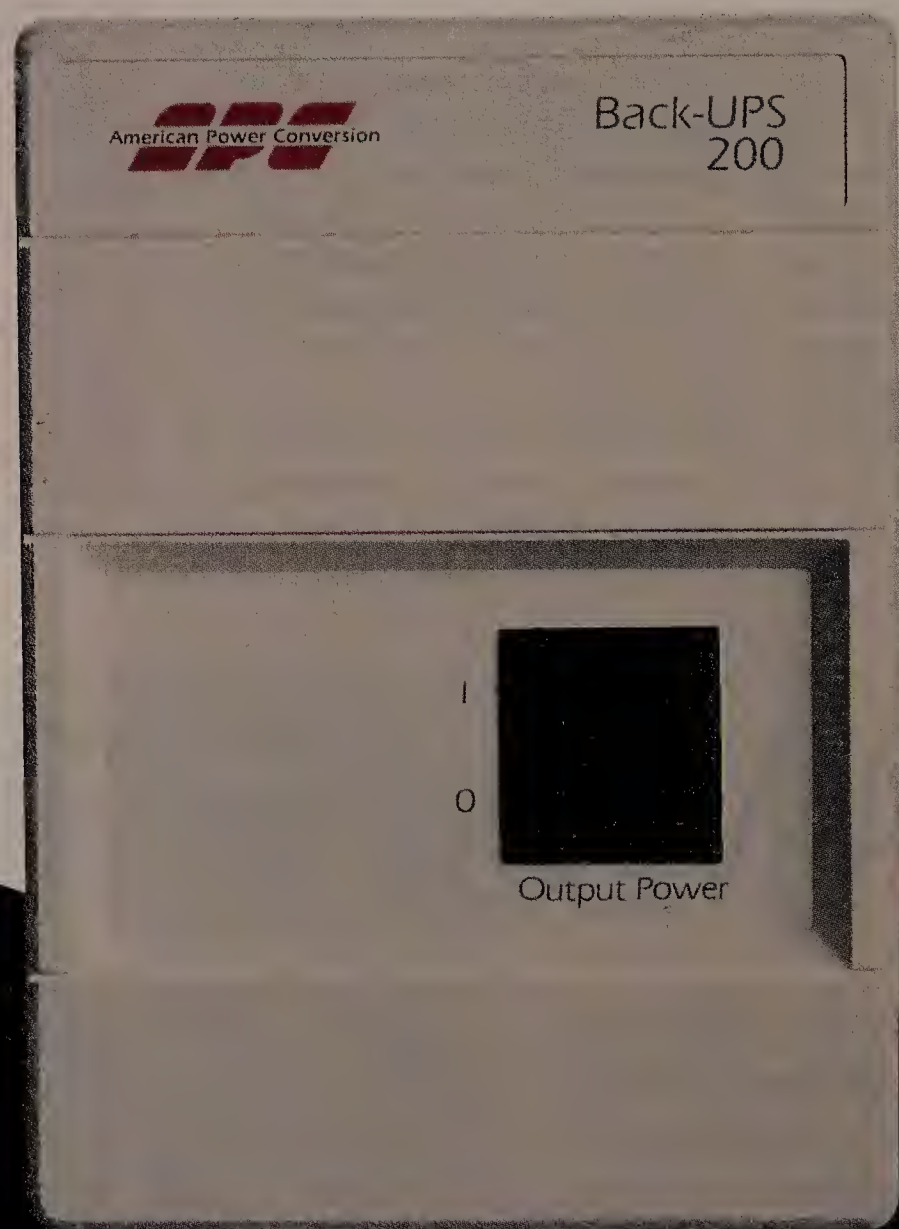

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NETWORK Q&A

Use WordPerfect's Start-Up Options to Minimize Network Traffic

Keith Nickerson

Q. *We have quite a few heavy* WordPerfect *users on our LAN. As I understand it, many* WordPerfect *functions download additional program code that's stored on the server. The traffic generated by these overlay files is slowing our network. What can we do?*

Clorella Blundish
Atlanta, Georgia

A. Like many applications, *WordPerfect* is too large to fit entirely into a DOS workstation's base memory. To get around this limit (the infamous 640K barrier), programmers use overlay files, which hold program code for various routines. Overlay files are not loaded into memory with the application. Instead, every time you invoke a command for one of those routines, the application loads the appropriate portion of an overlay file into a specific area of memory, overwriting any previous overlay code. The best way to reduce the impact of this overlay traffic is to reduce the frequency with which programs must access those files from the file server.

WordPerfect's most commonly used extra code is in WP.FIL, an approximately 600K file normally stored in the same directory as WP.EXE. Starting *WordPerfect* with WP /R (instead of just WP) loads the code from WP.FIL into expanded memory. Because that overlay code is then available from the local workstation, the program's overlay traffic on your network wire is minimized, and the performance of *WordPerfect* itself is improved. To use the /R option, you must have at least 620K of expanded memory free (or about 300K if you're still using *WordPerfect 5.0*).

Temporary files also generate network traffic. *WordPerfect* creates temporary "overflow" files to store whatever portion of your documents won't fit into memory. By default, *WordPerfect* puts these files in the directory that holds WP.EXE. If you access *WordPerfect* over the network, these files will be placed on the file server, generating network traffic. You can direct the temporary files to a local directory with the /D start-up option—for instance, WP /D-C:\TEMP. *WordPerfect*'s background print spooler also creates temporary files. To redirect them to a local drive, use the /PF start-up option: for example, WP /PF-C:\TEMP. Assuming your hardware allows, you'll get the best performance and least LAN traffic by combining all these options.

If you like, you can assign these options via a DOS SET command, which lets users forget all the start-up options and enter just WP at the DOS prompt. Many LAN administrators also assign *WordPerfect* user IDs with the /U start-up option, which makes sure people don't accidentally lose their settings by entering the wrong initials. For a user whose log-in initials are KTN, you'd add SET WP=/R /D-C:\TEMP /PF-C:\TEMP /U-KTN to AUTOEXEC.BAT.

On systems without expanded memory, you can reduce network traffic by copying WP.FIL to a directory on a local drive. When you start *WordPerfect* while logged to the local directory, the program will use that copy of WP.FIL rather than the one on the server, eliminating much of the overlay traffic on the network. This makes upgrading a pain, however, as you have to copy a new release's WP.FIL to every such workstation. Furthermore, older XT and AT systems often run *WordPerfect* more slowly off their sluggish local hard disks than they do off a fast file server.

If, like most of our readers, you're running NetWare on your LAN, one final trick to speed up *WordPerfect*'s performance is to print directly to network print queues rather than using NetWare's Capture utility. At the Select Printer: Edit menu, change the Port to Other (**Shift>-<F7>sepo**), then enter the name of the desired print queue.

One final tip: A new book, *Running WordPerfect on NetWare* by Joni Taylor of WordPerfect Corporation, provides an exhaustive examination of this topic. It's well worth a look if you're investigating ways to manage and streamline *WordPerfect* on your NetWare LAN.

Keith Nickerson is the editor of NetWare Advisor *and a member of the publishing team at Business Systems Group, a Houston-based systems integration firm.*

WHERE TO BUY

Running WordPerfect on NetWare
M&T Books
501 Galveston Dr.
Redwood City, CA 94063
800/533-4372, 800/356-2002 California
LIST PRICE: $29.95
Reader service no. 643

POWER TIP NO. 181

Easy LaserJet Printing With Norton Utilities

Norton Utilities 4.5's LP (Line Print) program assumes you can print 66 lines on a page, but the HP LaserJet allows only 62. In order to use LP easily with the LaserJet, create a simple one-line batch file: **lp %1 /h62**. Call it HPLP.BAT and put it in a directory listed in your system's PATH command. To print a text file, simply type **hplp** *filename*.

Lincoln Spector
Assistant Editor

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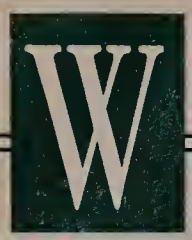

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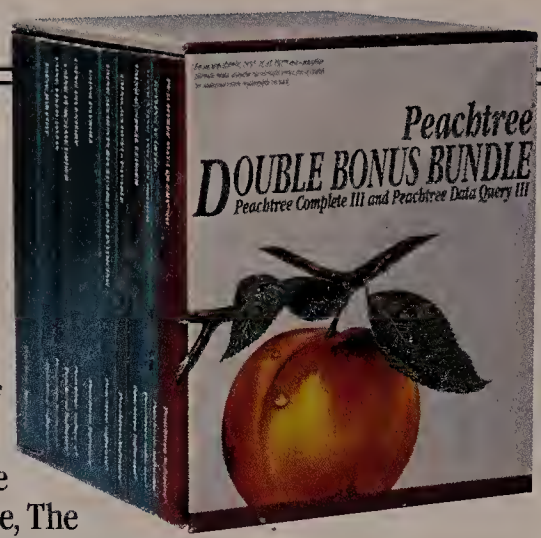

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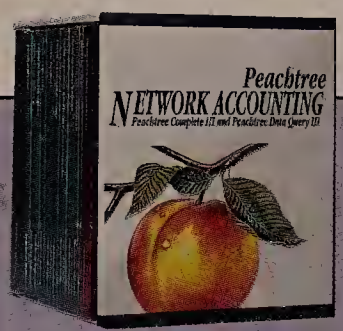

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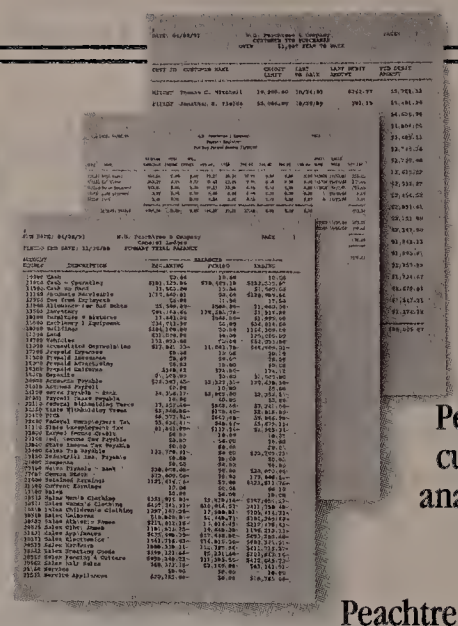

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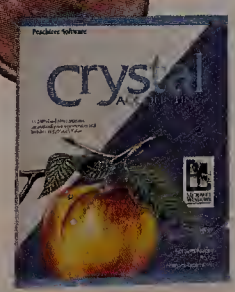

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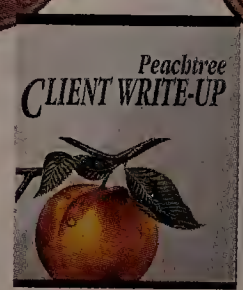

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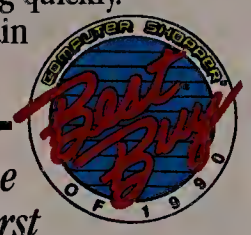

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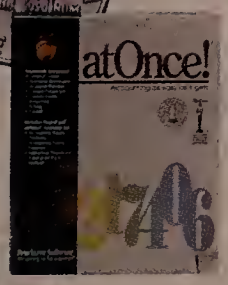

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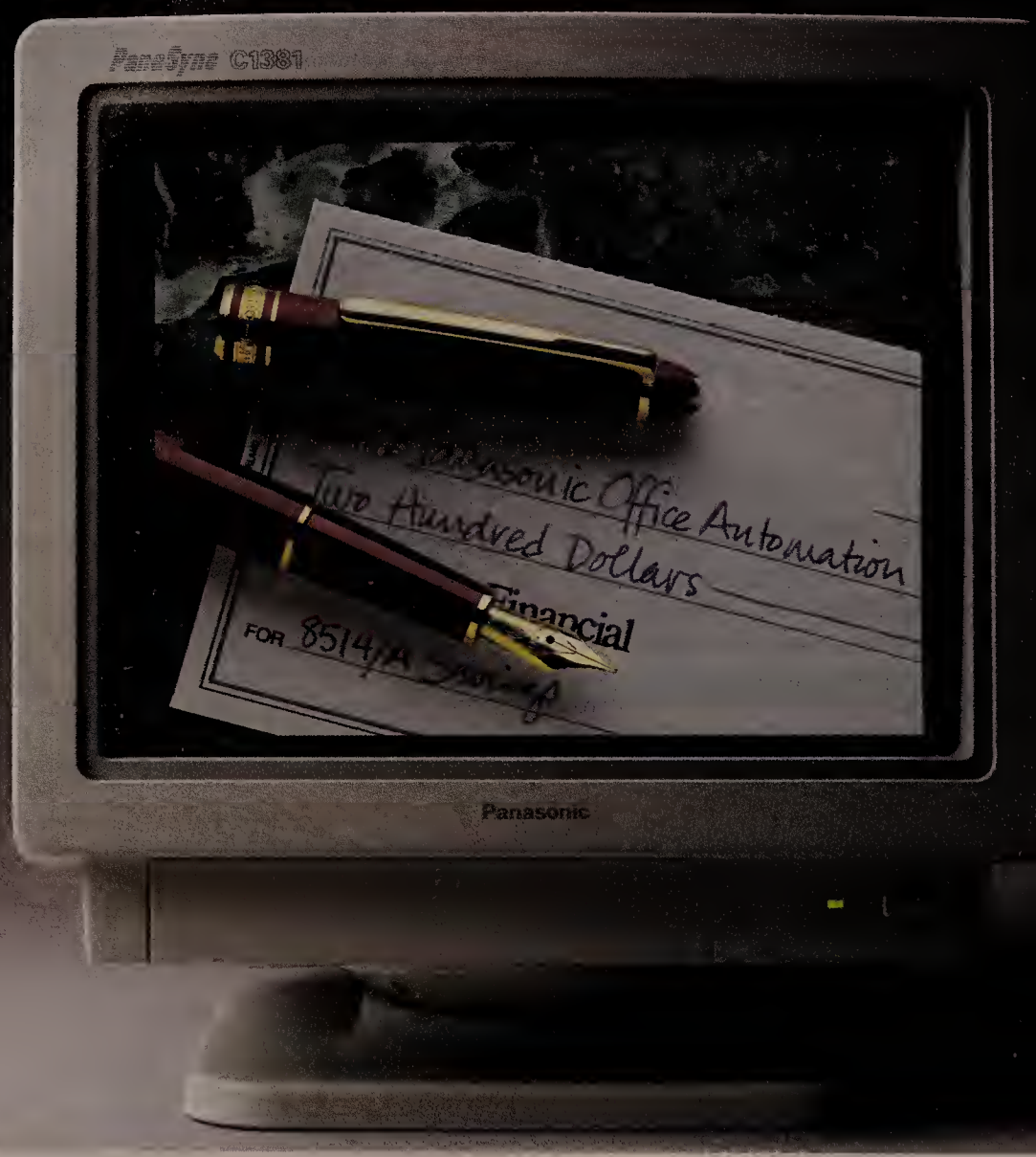

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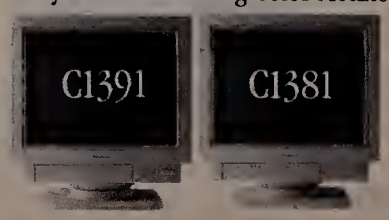

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M3-PCD

Circle 214 on reader service card

CONSUMER WATCH

Advice and information for the computer consumer

Beware of computers that come with preinstalled software on the hard disk but without manuals or licensing agreements. Chances are you've got pirated copies.

Roberta Furger

No Manuals With the Software? You May Have an Illegal Copy

I recently purchased a computer that was advertised as including *Windows 3.0* and MS-DOS 4.1. When the computer arrived, both *Windows* and DOS were installed on the hard disk, but neither the original floppy disks nor the usual license agreements were included.

Software on disks was included with the last computer I bought. Have the conventions changed? Am I correct in assuming that I am purchasing the rights to the software? How does Microsoft record these sales if the purchaser receives copies only on the hard disk?

Richard R. Pulliam
Chula Vista, California

Editor's note: Many computer manufacturers and dealers now preinstall DOS and other software on the hard disk—a legitimate practice that can save the PC buyer time during setup. In these instances, however, the buyer should still receive a complete set of manuals, floppy disks, and the standard license agreements and registration cards for the software, according to Sara Brown, litigation assistant at the Software Publishers Association. Documentation and registration cards are particularly important. Brown suggests that anyone who fails to receive either of these two items contact the manufacturer to verify that the copies are legal. Microsoft's toll-free number is 800/662-6796.

A Deal That Was Too Good to Be True

I ordered a Canon flatbed scanner (with interface card and cable) from Nevada Systems Inc. (NSI) of Torrance, California. When I placed my order I was told the price included everything I needed to run the unit.

When I received the scanner (about a week later), it was not in its original packaging, and the interface board and cable were not included. I called NSI, and the salesman told me the boards were on back order. I was not told this when I placed the order, and I would not have purchased the unit if I'd known.

I have called NSI once a week since the middle of December to find out when I would receive the board and cable. I have been told that the board was shipped and then, when I didn't receive it, that the order hadn't come in as expected or that they hadn't received enough units to send mine.

I have had $879 tied up since December 3, 1990, in something I have yet to receive.

Nancy A. Butler
Enfield, Connecticut

Editor's note: Consumer Watch *received four letters from NSI customers (continues)*

BUG WATCH

Up-to-date information about hardware and software bugs

Andrew Tobias' Managing Your Money 7.0

An install error in the latest version of Andrew Tobias' Managing Your Money from MECA Software prevents some users from correctly converting data from version 6.0 of the program to the current version. MECA is working on a maintenance release to fix the conversion problem and other maintenance issues. It will be automatically sent free of charge to all registered users this spring.

MECA Software
203/222-9087

Ventura Publisher 3.0 for Windows

Intermittent problems have been reported with printing Ventura documents that contain PCX files. Although the items (such as bit-mapped graphics) appear to be aligned correctly when viewed on screen, when printed out, the bottom third of the graphic can get cut off, with either blank space or a bar-code type symbol appearing at the top of the frame. A spokesperson for Ventura says the company is aware of the problem and is working on a fix, but declined to give a release date.

Ventura Software
800/822-8221

Have you run into a software bug or hardware incompatibilty? Call us at 415/978-3253 with the details. We'll investigate problems and publish those of broadest interest.

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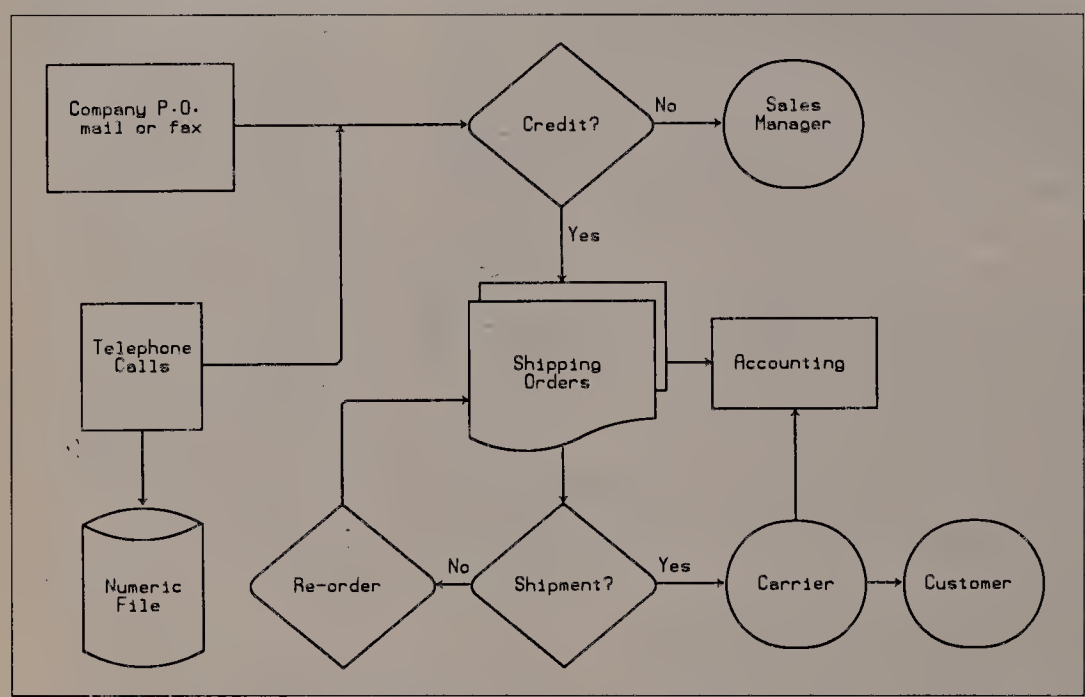

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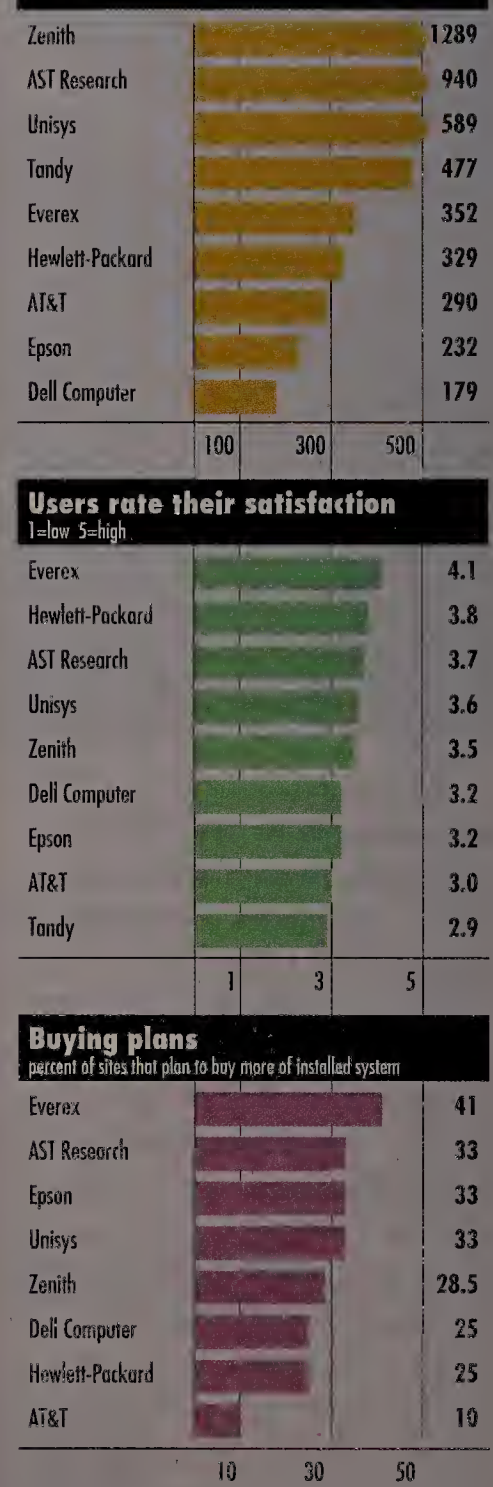
Circle 79 on reader service card

RATE YOUR SATISFACTION: PC Compatibles

Corporate customers are turning increasingly to compatibles makers for high-quality systems at lower prices than comparable units from IBM or Compaq. Zenith Data Systems is at the top of the list of compatibles makers. It does not rate as high in user satisfaction or purchase plans, however. Instead, systems from Everex rate highest in both those categories, reflecting the company's reputation for high-performance systems and competitive prices.



Source: International Data Corp. From a survey of 200 large organizations, each with at least 50 PCs.

(continues)

who took the company up on its offer of low-priced scanners, which were selling for less than half the suggested retail price. Customers report having paid for—but not received—products, receiving incomplete orders (scanners minus interface cards), or getting seemingly used merchandise.

After receiving inquiries from Consumer Watch, *NSI contacted customers with unfulfilled orders to begin rectifying outstanding problems.*

According to president Chuck Campbell, NSI, which frequently purchases discontinued merchandise, bought 1900 Canon scanners but did not receive all the necessary interface cards. Although customers writing to Consumer Watch *say they were not informed of the shortage of boards prior to placing their orders, Campbell says he indicated at the time of sale that the items were on back order.*

Unfulfilled Promises

Northgate's ad states, "We hear you." Unfortunately, getting them to respond is another matter. I received my hard drive–equipped Slimline 386 minus the 64K cache I had ordered. Further, my credit card was charged a month before my computer was shipped, contrary to Northgate's advertised policy. To the five letters I sent concerning these problems Northgate responded only once. Attempts to contact the company by phone from my duty station in Germany have proved expensive and futile.

The one reply I received from Northgate said they would reimburse me for telephone costs ($38.95) arising from the delayed shipment of my system. They also acknowledged the hard disk error and agreed to supply a hard disk with cache. I was also told I would be reimbursed $38.57 for credit card costs due to the billing error.

Unfortunately, Northgate hasn't followed through on its promises, and my subsequent three letters have gone unanswered.

Michael S. Vaughn
APO, New York

Editor's note: After being contacted by Consumer Watch, *Northgate has sent Mr. Vaughn the correct hard drive and reimbursed him for his phone costs and credit card interest. According to Northgate customer satisfaction representative William Everson, the lengthy delay (the new hard drive and refund were originally promised by Northgate in* December 1989*) was due to changes in personnel and failure to refer the matter to the customer satisfaction department. The fact that several letters and phone calls went unanswered, however, indicates a need to revamp the system—which, according to Everson, is being done.*

(continues)

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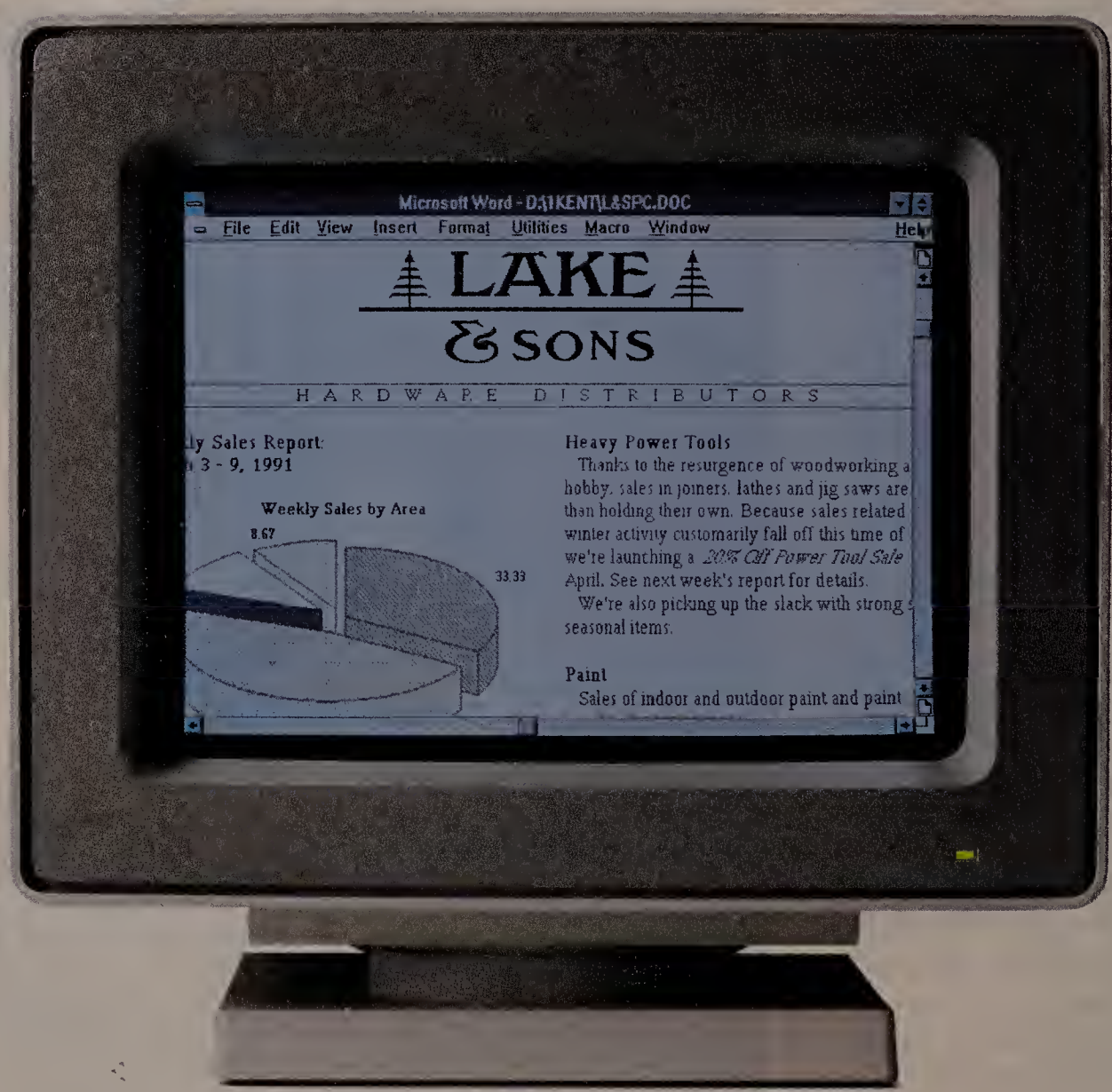

(This impression courtesy of Microsoft Excel and Word for Windows.)

When you combine Microsoft® Windows™ applications with any Hewlett-Packard® LaserJet® III printer, you will not only get excited about your work, but a lot of other people will get excited about the work you do.

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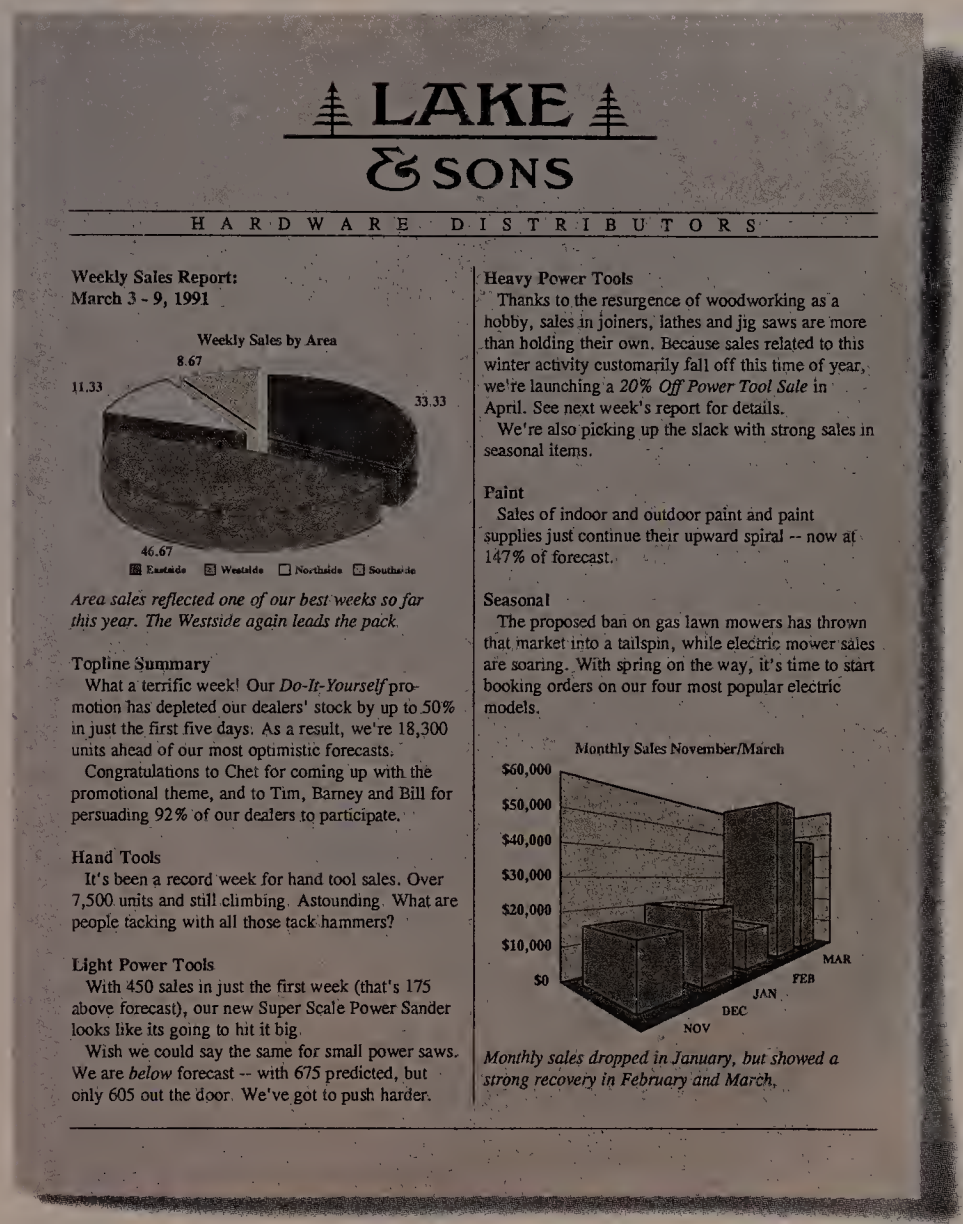
And everybody else.



LAKE & SONS

HARDWARE DISTRIBUTORS

Weekly Sales Report:
March 3 - 9, 1991

Area sales reflected one of our best weeks so far this year. The Westside again leads the pack.

Topline Summary

What a terrific week! Our *Do-It-Yourself* promotion has depleted our dealers' stock by up to 50% in just the first five days. As a result, we're 18,300 units ahead of our most optimistic forecasts.

Congratulations to Chet for coming up with the promotional theme, and to Tim, Barney and Bill for persuading 92% of our dealers to participate.

Hand Tools

It's been a record week for hand tool sales. Over 7,500 units and still climbing. Astounding. What are people tacking with all those tack hammers?

Light Power Tools

With 450 sales in just the first week (that's 175 above forecast), our new Super Scale Power Sander looks like its going to hit it big.

Wish we could say the same for small power saws. We are *below* forecast -- with 675 predicted, but only 605 out the door. We've got to push harder.

Heavy Power Tools

Thanks to the resurgence of woodworking as a hobby, sales in joiners, lathes and jig saws are more than holding their own. Because sales related to this winter activity customarily fall off this time of year, we're launching a *20% Off Power Tool Sale* in April. See next week's report for details.

We're also picking up the slack with strong sales in seasonal items.

Paint

Sales of indoor and outdoor paint and paint supplies just continue their upward spiral -- now at 147% of forecast.

Seasonal

The proposed ban on gas lawn mowers has thrown that market into a tailspin, while electric mower sales are soaring. With spring on the way, it's time to start booking orders on our four most popular electric models.

Monthly sales dropped in January, but showed a strong recovery in February and March.

(This impression courtesy of the Hewlett-Packard LaserJet III printer.)

The Hewlett-Packard LaserJet III family of printers. The perfect companion to Microsoft Windows applications.

comes with scalable fonts supported by our Windows applications. So you get thousands of font choices. As well as the ability to print in record speed. And to ensure that you get crisp, clear output, HP developed a new technology they call Resolution Enhancement™. But you'll call it simply amazing.

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We've taken two of our best selling Lotus add-ins – Sideways and P.D.Queue – and combined them into one money-saving package. So you can print as many columns as you want, and get back to work fast.

Sideways turns your text on its side as it prints. So you can make great-looking extra-wide spreadsheet printouts all in one piece – without staples, glue or tape.

And P.D.Queue, the add-in print spooler, gives you back control of your computer seconds after you start a printout. So you can get right back to work while P.D.Queue operates your printer in the background.

Now you can get both at one great price of $129.95 – a savings of over 25%.

Ask for "Sideways with P.D.Queue" at your software dealer or call us at 1-800-822-3865 ext. 228.

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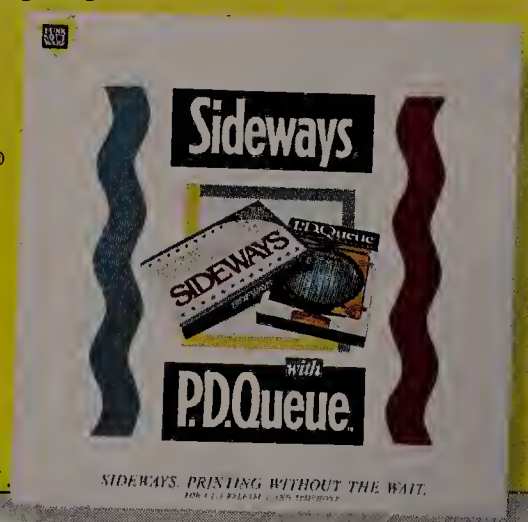

FUNK SOFTWARE

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Circle 157 on reader service card

Shareware Developer Comes Through

In January of 1990, I purchased a shareware program for creating computer-based tutorials from a Los Angeles–based firm called Computer Knowledge. Six weeks later I received the software and the user's manual. Every-

(continues)

PC WORLD SERVICE EXCELLENCE AWARD

SERVICE EXCELLENCE

Each month Consumer Watch *recognizes one PC company's commitment to service based on reports from readers.*

Last November I purchased a 386-25 tower computer with a Sony monitor from Gateway 2000. Everything worked fine initially, except that the video board had an unacceptably loud hum. Gateway shipped at no cost a replacement board, but while *Windows* worked in color with the new board, everything else stayed in monochrome. Gateway tried to correct the problem with two other boards, new software, and a new monitor. Finally, they shipped a complete system.

When installing the new system I discovered the problem was specific to the monitor cable (which I had not changed, despite Gateway's having sent one earlier). Gateway had needlessly spent a large amount of money on consultation and shipping.

When I offered to reimburse Gateway for the shipping costs, they refused my offer. Not merely does Gateway stand behind its products, they insist on satisfying their customers—at their own expense.

Douglas Purl
Missoula, Montana

Until now, sharing a printer could cause excessive wear on some of your equipment.

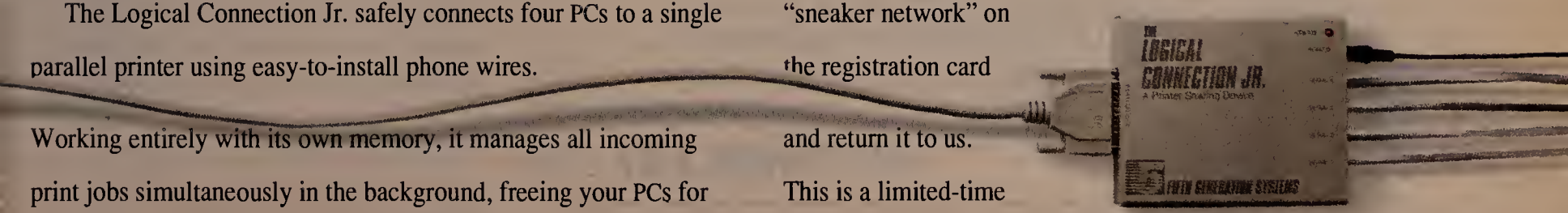
If you're on a sneaker network running between several PCs and one printer, your patience and productivity—among other things—are probably wearing a little thin.

And it could be worse. Major manufacturers report that you may actually damage your laser printer if you use a mechanical switchbox. But now there's The Logical Connection Jr.™

The Logical Connection Jr. safely connects four PCs to a single parallel printer using easy-to-install phone wires.

Working entirely with its own memory, it manages all incoming print jobs simultaneously in the background, freeing your PCs for business while it prints jobs in the order received. And although it runs beautifully without any software, it comes with a powerful utility program that maximizes printing speed. And it does all that for less than $60 per PC.

To find out more about The Logical Connection Jr., call 1-800-388-0362. Buy it, and we'll foot the bill for a free copy of Mace Performance,™ the $69 hard disk optimizer. Just write "sneaker network" on the registration card and return it to us. This is a limited-time offer, so step on it.



Fifth Generation Systems, Inc.
10049 N. Reiger Road, Baton Rouge, LA 70809
Technical Support: (504) 291-7283

Circle 235 on reader service card

thing worked as expected.

I ordered an update in June of last year so that I could create my own opening screen (something not possible with the basic program). The newer version was supposed to be available in July, but by the end of that month I hadn't received anything. August, September, and October passed without a word.

By this time I was losing my trust in shareware. I wrote a letter to the president of Computer Knowledge and enclosed a copy of my money order in the hope that the company was still in business.

At the end of December I received the program with a letter of apology, telling me they had misplaced my order unopened. Not only did I receive the program, but the president enclosed my uncashed money order (for $105), plus another application that I had not ordered. My trust in shareware has been restored.

Ferry Strube
The Netherlands

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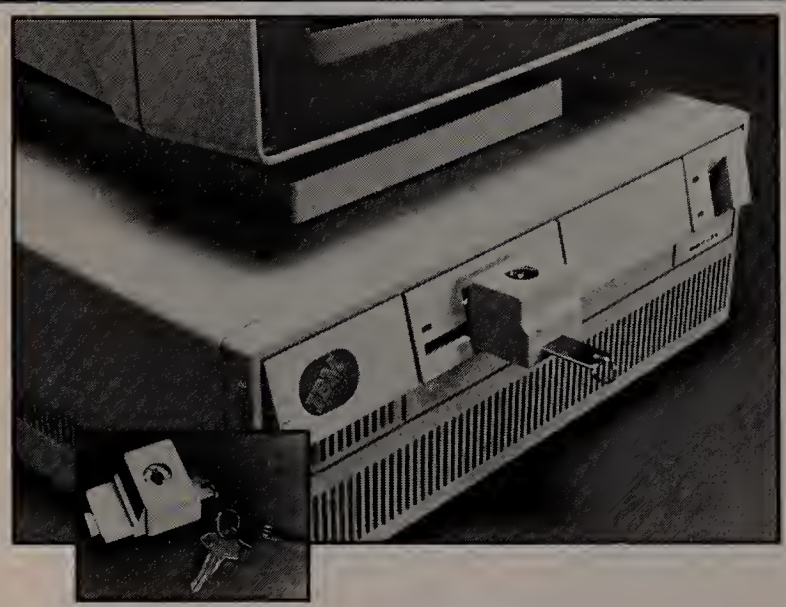
PROTECT THE INFORMATION YOU DEPEND ON!



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TELL ME MORE!

FREE information on the products featured or advertised in *PC World* can be requested using the postage-paid Reader Service Card found in this issue.

PC WORLD

Credit Due, but not Forthcoming

I purchased a math coprocessor from Unitex of Irvine, California, which failed and was returned during the warranty period. I was told that a new unit would be shipped and charged against my credit card, but that my account would be credited as soon as the defective chip was received.

When I called to find out why the credit had not been issued, I was told the credit department was behind in its paperwork. I have spoken with Unitex employees four times and have been promised immediate action each time.

At no time has Unitex denied that they owe me a refund; they just keep making excuses about why it hasn't been issued yet. I can't believe that my $249 is worth so much trouble to them, unless they are in financial straits.

Steve Peaslee
Stockton, Kansas

Editor's note: Unitex's attorney Richard Brownstein told Consumer Watch *that the company has filed for reorganization under Chapter 11 of the U.S. bankruptcy laws. A reorganization plan is expected to be filed toward the end of the second quarter of this year.*

Customers owed money or products have been included on the company's list of creditors, which was submitted to the court last March, and should have received official notification of the reorganization proceedings. No refunds or back-ordered products will be shipped, however, until after the reorganization plan has been approved.

Think you've gotten a raw deal—or a great one? Send the details to (continues)

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Circle 3 on reader service card

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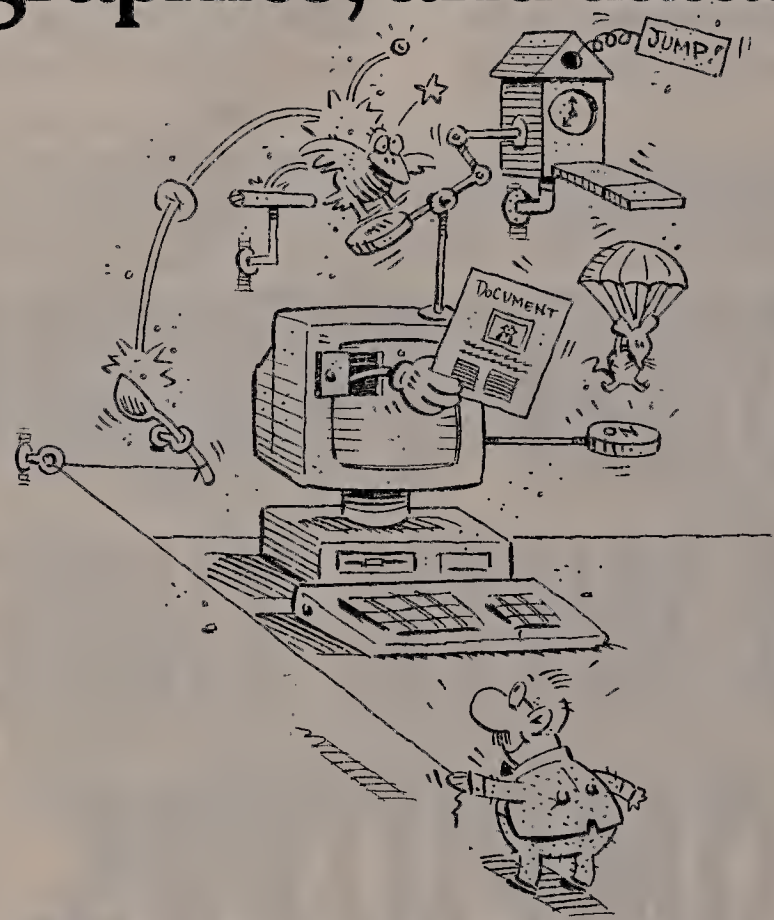

Or you can get Legacy.®

You'll find all kinds of bells and whistles built into other advanced word processors. And while they might seem appealing at first, using them to create high-impact documents means you spend a lot of time just spinning your wheels.

But not with Legacy. Because Legacy was designed specifically to give you the best combination of word processing, graphics and desktop publishing in one complete program. Its unique frame-based design and powerful word processing lets you create high-impact documents easier and faster than with any other advanced word processor. All on one screen, without ever exiting your document.

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Circle 119 on reader service card

Consumer Watch, PC World, *501 Second St. #600, San Francisco, CA 94107; MCI Mail PC World Editorial; CompuServe 74055,412; or 415/442-1891 (fax). We'll investigate complaints and publish letters with the broadest interest.*

POWER TIP NO. 182

Switching Screen Modes in Windows 3.0

If you have a super-VGA card and monitor, you'll probably want to install high-resolution drivers for *Windows 3.0*. But you may also want to be able to switch from one resolution to another. So that you can do this, set up *Windows* for the standard 640-by-480 VGA mode, exit to the DOS prompt, and enter **md\640x480**. Go to your *Windows* subdirectory, and enter **copy *.ini 640x480** to copy the configuration files into their own directory. Follow the installation instructions that come with your high-resolution drivers; then make another directory, such as **\800x600** or **\1024x768**, and copy the INI files into that. Finally, create a batch file for each video mode you've installed and place them in a directory that's named in your PATH.

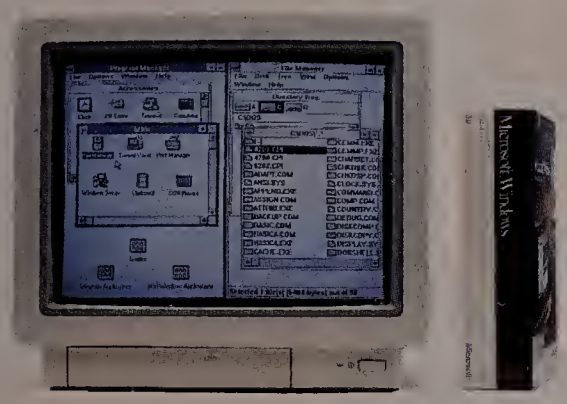
Here's a sample batch file called WIN800.BAT (substitute your own drive and directory names):

```
@echo off
cls
copy c:\800x600 c:\windows >nul win
```

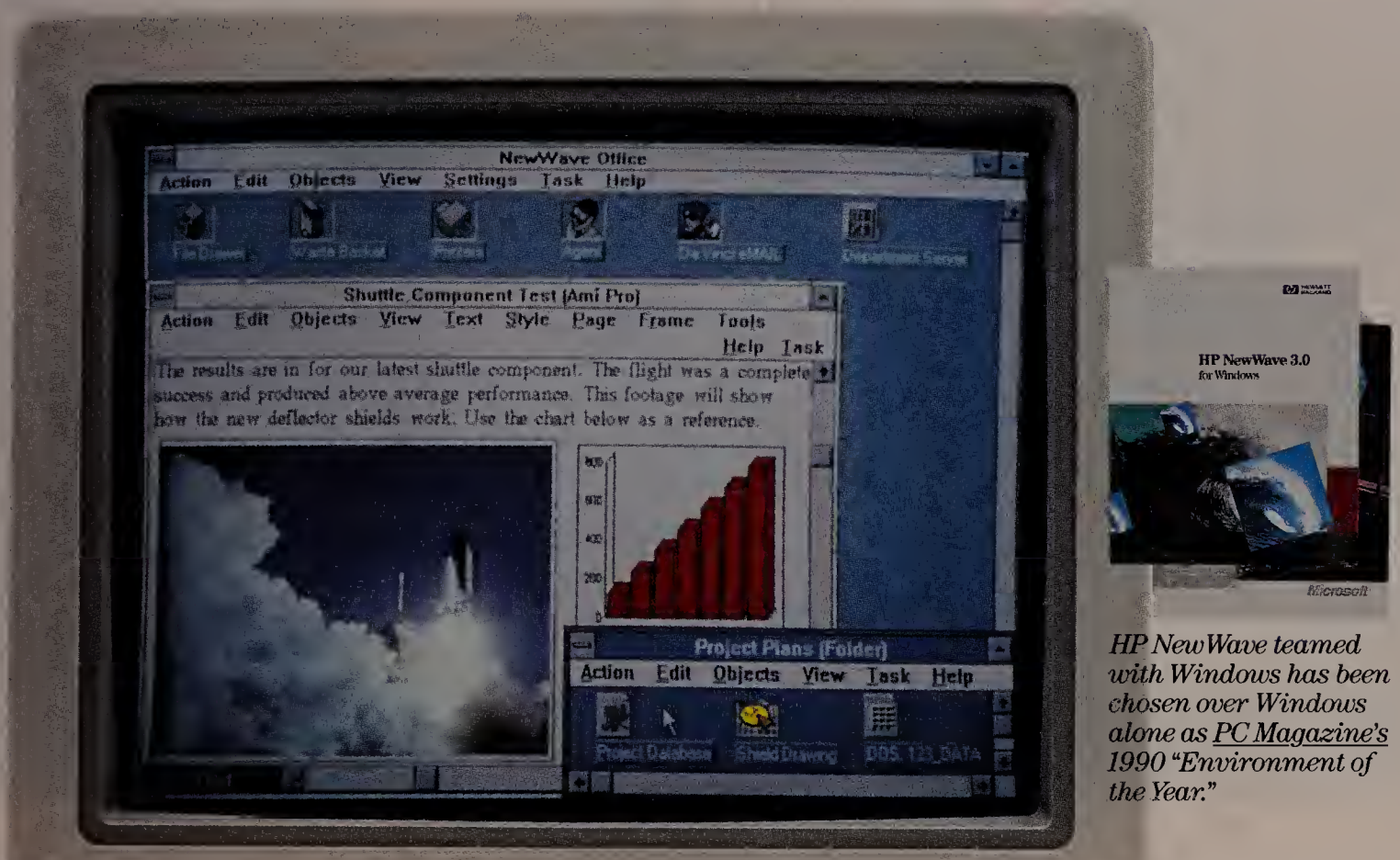
Start *Windows* in any screen mode by executing the appropriate batch file.

George Campbell
Contributing Editor

You're one of millions who started with this vision of productivity...



...and are about to discover how to actually achieve it.



HP NewWave teamed with Windows has been chosen over Windows alone as PC Magazine's 1990 "Environment of the Year."

Words can't capture what HP NewWave software adds to Windows. You have to experience it in motion.

Get our interactive demo disk, and you'll know why the editors of PC Magazine chose NewWave as "Environment of the Year." You'll discover:

- how much easier NewWave is to learn and use than Windows alone.
- how much simpler it is to combine information from word-processing, spreadsheet, graphics and other applications, for greater impact.
- how only NewWave can perform everyday tasks like sales reports and inventory updates automatically, even while you're home asleep.

To put it simply, people had hopes for Windows, but it's NewWave with Windows that really delivers on them. Don't take our word for it, get our interactive demo disk. ($3.95 handling charge)

Call 1 800 345 9111 x23B

HEWLETT PACKARD

Act now for a $25 rebate

Buy HP NewWave between 5/1/91 and 8/30/91, then send this coupon, original product registration card, and your sales receipt to HP Program Awards Center, P.O. Box 59058, Minneapolis, MN 55459-0058. Must be postmarked by 9/6/91.*

Name & Title

Company Phone

Street address

City, state, zip.

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Circle 29 on reader service card

MANAGER'S FILE #3

Getting the Most Out of Consultants

Consultants, like lawyers, often get a bad rap. Although U.S. businesses spend millions of dollars each year on consulting services, more often than not you hear about the disasters, not the successes.

Still, few companies have the experience and expertise necessary to design and maintain a computing architecture that's going to ensure competitiveness over the long haul. For most businesses, turning to an outside expert is inevitable. So what can you do to ensure that your money and time are well spent?

Understanding your company's needs and conveying them clearly to the consultant are key, say businesspeople and consultants alike. You may not know what you want or need from a technical perspective, but a good consultant should be able to translate your business goals into technical solutions. That means finding someone who "speaks your language"—someone who knows your business and has assisted other companies in similar circumstances.

One Size Doesn't Fit All

As the technology gets more complex, consultants tend to specialize in one particular facet of computer design and installation. So the person who designs a strategic data base for your company's sales force isn't likely to be the one who recommends a strategy for connecting all your departments via a local area network. And your network designer is probably not going to be the person who installs the hardware and software. Be prepared, then, to deal with not one but a series of providers, particularly on larger, more complex projects such as implementation of strategic systems.

Regardless of the project, beware of your consultant's prior affiliations —either with particular hardware and software companies or with certain computing strategies or approaches. You'll minimize the risk of having to retrofit a solution to your needs if you're aware of someone's preferences ahead of time. You may want to consider splitting projects into design and implementation phases. By dividing responsibility in this way you minimize the danger that the recommended solution is based primarily on a consultant's financial motives.

Set Specific Goals

Your work isn't over once you've hired the consultant. It's important to have clearly defined checkpoints throughout the project so you can evaluate progress. Make sure you've developed measurable criteria by which you can assess performance, and keep open the option of terminating the relationship if either you or the consultant is dissatisfied.

It takes a lot of work to ensure a successful consulting arrangement, but knowing what you want and communicating your needs to the consultant increase your chances for success.

Before hiring:

- ✔ **Conduct a detailed needs assessment—know what you want *before* you sign a contract.**
- ✔ **Obtain references from associates in your field; ask specific questions about reliability, responsiveness, quality of work performed.**
- ✔ **Look for someone with a proven track record; review prior work (if hiring a consultant to create an application) and visit installations (for strategic systems design).**
- ✔ **Make sure that the consultant's style matches that of your organization.**

When negotiating:

- ✔ **Establish clear areas of responsibility and authority.**
- ✔ **Have a legal counsel review the contract.**
- ✔ **Determine "ownership" of code at project completion.**
- ✔ **Obtain a detailed cost breakdown.**
- ✔ **Establish a specific time frame for project completion.**

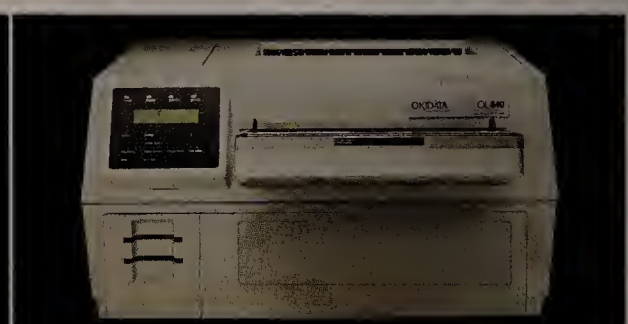
When working with a consultant:

- ✔ **Designate a company liaison.**
- ✔ **Involve users in system design.**
- ✔ **Develop specific checkpoints for evaluating progress.**

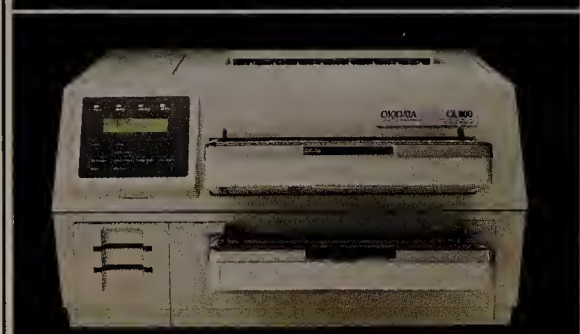
Our 8ppm printer earned the Okidata OK!™ by offering you something the LaserJet® III doesn't.

The OL800: 8ppm page printer $1499

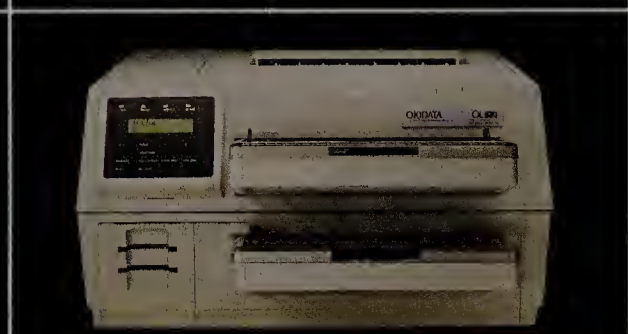
The OL820: W/built-in font scaling $1999



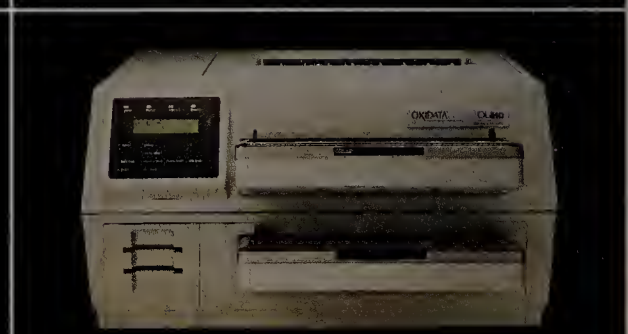
The OL840: W/PostScript $2999



The OL800: W/200 sheet 2nd paper tray

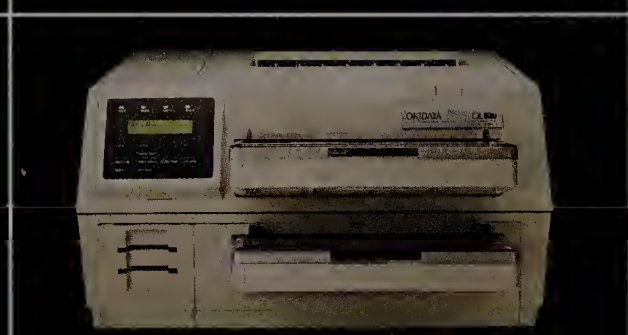


The OL820: W/200 sheet 2nd paper tray

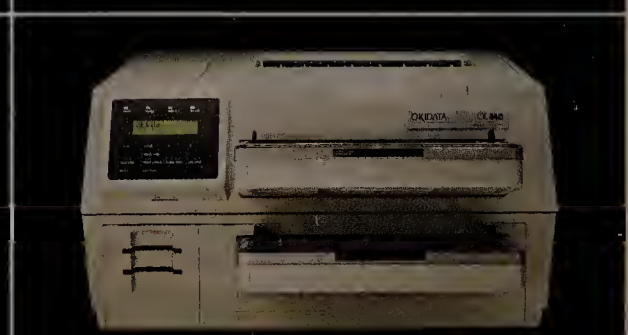


The OL840: W/200 sheet 2nd paper tray

The OL800: W/multi-user port (3 add'l users)*



The OL820: W/multi-user port (3 add'l users)*



The OL840: AppleTalk Network Ready

Freedom of choice.

Your best choice in an 8 ppm page printer is the one that gives you the most to choose from: the Okidata OL800 Series.

With Okidata, you're free to choose the features you need, free to save money by eliminating features you *don't* need, and even free to change your mind later.

The OL800: No Frills, But All The Options.

For only $1499** list, the Okidata OL800 gives you a full-featured 8 ppm printer: 26 fonts, 4 typefaces, HP Series® II compatibility, both serial and parallel interfaces, and the industry's only 5-year warranty—on Okidata's unique LED printhead.

As your needs grow, you can easily add options that are *no* option with the LaserJet® III—a second paper tray for more flexible paper handling, or a network port that automatically accepts output from three additional PCs in a workgroup. You can even upgrade your OL800 to match either of our high-performance printers described below.

The OL820: Faster Than A LaserJet III.

Besides having more resident scalable fonts than the LaserJet III (13 versus 8), the OL820 also has more brains. Thanks to a unique hardware chip designed by Okidata engineers, it instantly solves complex font scaling, type rotation and grayscaling problems "on the fly"—problems the LaserJet has to go back to its software to work out.

So the Okidata OL820 can deliver up to three pages of sophisticated text while the LaserJet III is still thinking about printing its first page. In fact, InfoWorld magazine found the Okidata OL820 to be "the fastest office printer we've tested."

Second paper tray and 4-station workgroup options are available for your Okidata OL820 as well.

The OL840: PostScript From PC To Mac And Back.

If Adobe PostScript® printing is on your menu, the Okidata OL840 offers it for $700 less than a comparably equipped HP. Yet that low list price includes 35 genuine Adobe PostScript fonts, plus 26 bitmapped fonts (4 typefaces); 2 megabytes of installed RAM; plus serial, parallel, and AppleTalk Network® interfaces. You can connect the OL840 to both PC and Macintosh® workstations, and switch between systems instantly.

And the OL840 still leaves you with plenty of options—a second paper tray, extra memory, and a wide selection of additional PostScript fonts on easy-to-install ROM cards.

Finally, every Okidata OL800 Series printer has earned the Okidata OK!—your personal promise from us that it will deliver not just good value, but exceptional value...will provide not just adequate performance, but outstanding performance.

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We don't just design it to work. We design it to work wonders.™

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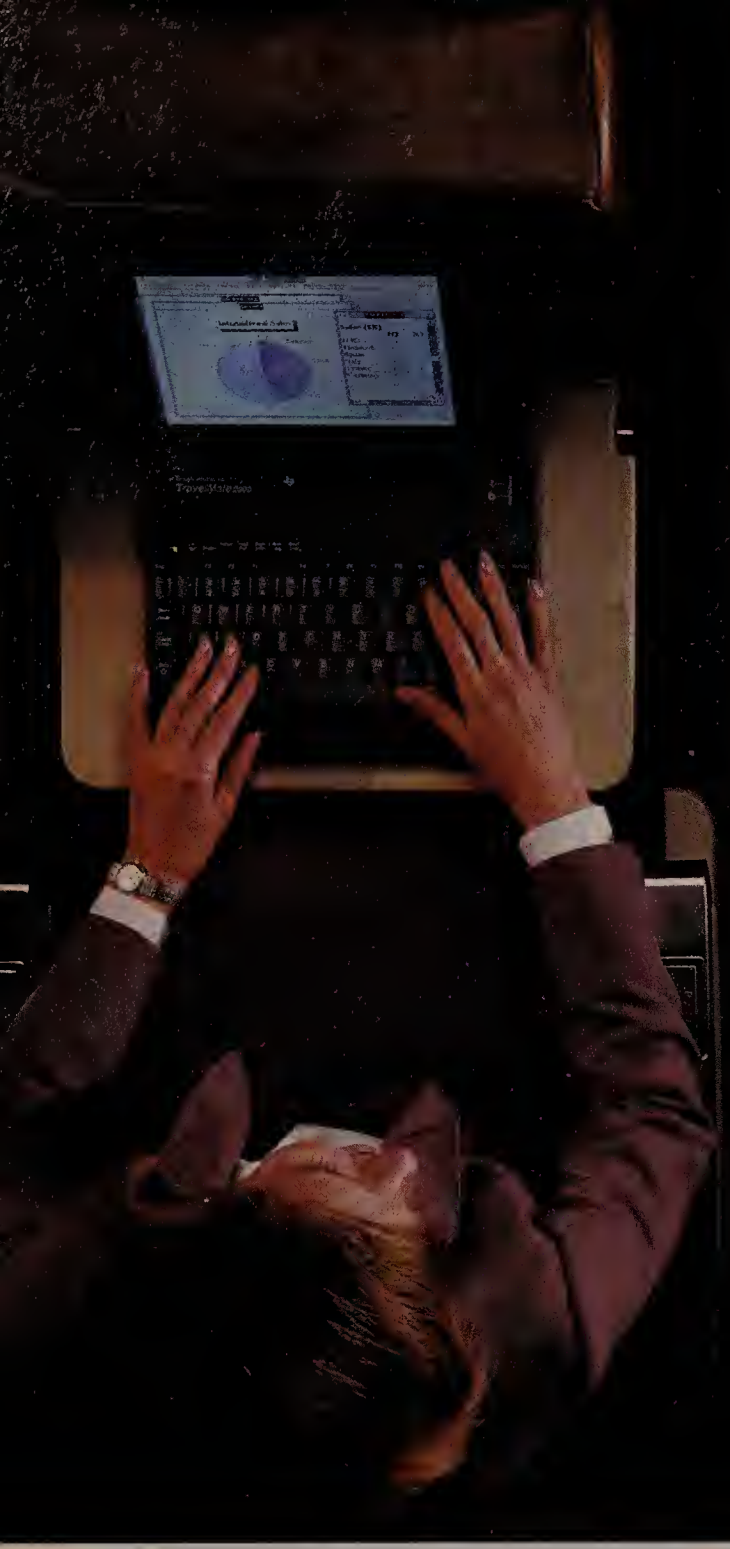

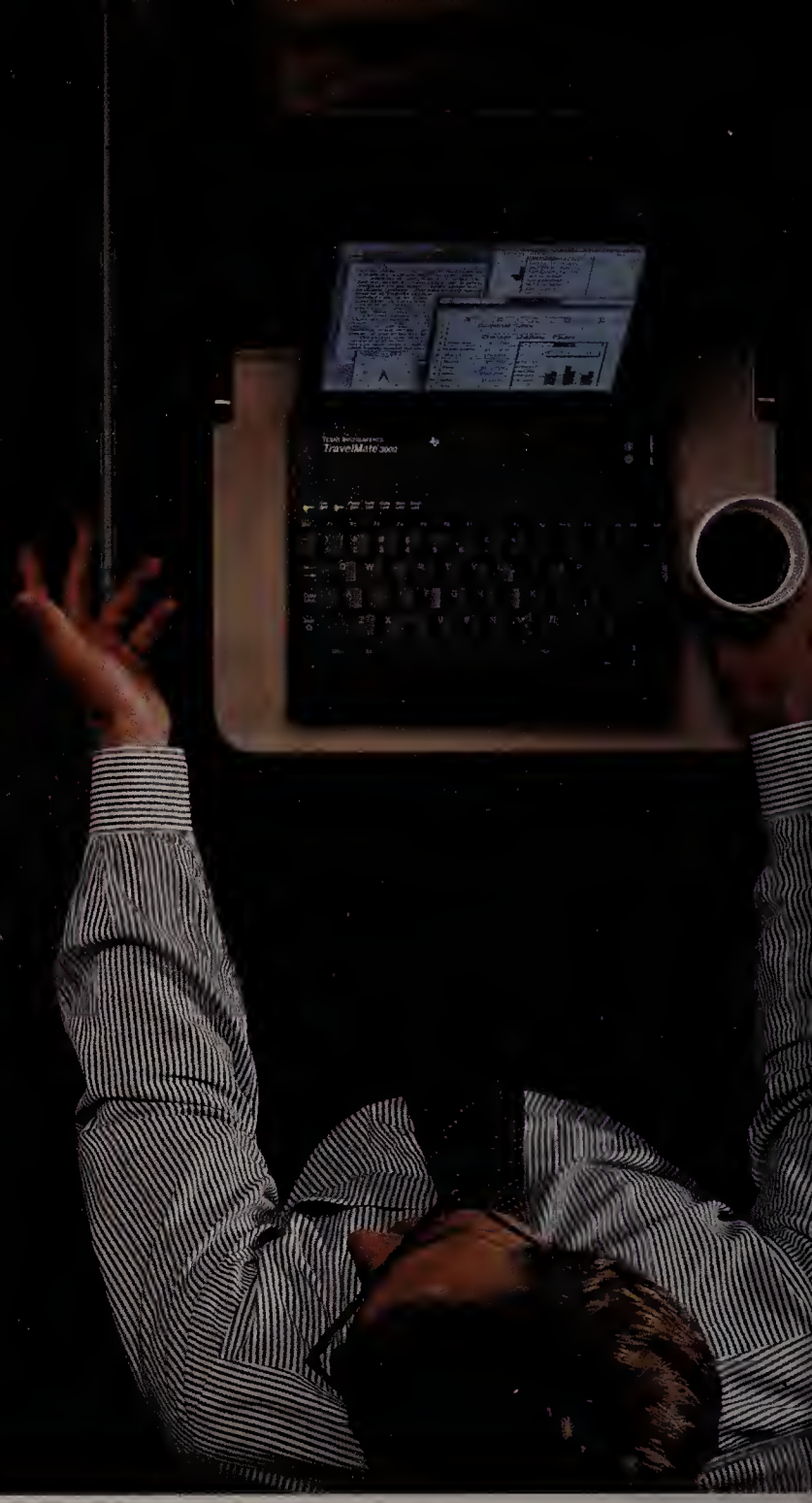

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The new look of power. Editors across the country are praising the performance, size and weight of the Texas Instruments TravelMate™ 2000 and 3000 notebook computers.

"The TravelMate is as close as you can get to the ultimate portable." – *BYTE*, November 1990.

"Now TI assumes the lead in performance/pound/price measure of a notebook."– *PC Magazine*, December 11, 1990.*

"Not until you hold this computer in your hands do you begin to understand what sets it apart from the pack."– *PC Computing*, December 1990.**

Both TravelMate models are only 8½" x 11" in size, including a hard disk drive, and feature a 10" diagonal VGA display and comfortable full-function keyboard.

With the TM 2000 you get 286™ processing in a computer that's 1.4" thin and 4.4 lbs. light. The TM 3000, meanwhile, packs 20MHz 386™SX power into a mere 1.8" and 5.7 lbs.

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Circle 264 on reader service card

Edited by ERIC BENDER

Traditional Dealers, Software Stores Pressured

Superstores Leap Retailing Bounds

Giant Outlets Offer Bargains, Diversity of Products

"In Dallas, the superstores have driven most of the other retailers out of business," notes consultant Jim Hoisington.

LES WOLLAM

Users everywhere are talking more and more about computer "superstores" as the cheapest, easiest way to buy hardware and software. These huge warehouses stock tens of thousands of name-brand PC hardware, software, peripheral, and related office products at 60 to 80 percent off retail—the lowest prices in town.

A superstore is to the local ComputerLand or Businessland what a gigantic supermarket is to a corner mom-and-pop grocery. It offers low prices coupled with a wide selection of products. Usually located outside traditional shopping districts in warehouses from 15,000 to 35,000 square feet in size, superstores provide ample parking and even loading docks for their more voracious consumers.

Chains such as Comp USA (formerly Soft Warehouse) and Micro Center stretch across the country. Nationwide, 78 superstores will be open by year-end, estimates Seymour Merrin, president of Merrin Associates, in Palo Alto, California. He attributes this meteoric rise—at a time when traditional PC retailers are suffering financial woes—to the increasing sophistication of users.

"It's rare that I can find a computer salesman who knows more than I do," says Paul Bryant, an assistant vice president at the International Bank of Japan in Los Angeles. "A technology warehouse where I can tell them to send me 300 of a given product immediately, pay the lowest price, and not have to listen to a naive sales pitch is therefore very attractive."

Crowding Out Dealers

When a superstore enters a region, traditional retailers' prices drop almost immediately. Many of these stores can't take the pressure, notes Jim Hoisington, a Dallas PC consultant and president of the North Texas PC User Group, who lives across the street from a Comp USA store. On weekends Hoisington battles hoards of buyers who overflow two parking lots and street parking for blocks in all directions. "In Dallas, the superstores have driven most of the other retailers out of business," he says.

Superstores stock even more business titles than software-only stores—as many as 3000. Although peripherals such as printers, fax boards, and modems are offered from just about every vendor, the choice of PCs generally excludes IBM, Compaq, and Apple. There are some exceptions among superstores that started out as retailers.

As they kept overhead costs to an absolute minimum, superstores got a reputation for skimpy service and support. However, buyers say this is changing. The major chains now have reputable carry-in service departments—some even offer third-party on-site service contracts. And most superstores have added corporate sales staffs that are assigned to business accounts.

Super Advice?

Ken Zoline, a Chicago networking consultant, has listened in at the service counters of local superstores and says the level of help is inadequate. Others point out, however, that this problem is hardly limited to superstores.

"I'm not sure that superstores are worse offenders than nonsuperstores in terms of giving out bad advice," says Sanford Rosen, president of The PC Consulting Company in Columbus. The no-questions-asked, 30-day money-back guarantee most superstores offer makes purchasing much less risky, he says.

Many PC users find help both before and after the purchase by pairing superstores with independent consultants. "A knowledge-provider who is not a reseller has much lower overhead, and so services can be offered much less expensively," Merrin points out.
—*Alice LaPlante*

Superstores on the March

Top six chains, projections for year-end 1991

Chain	Location	Number of Stores
Comp USA	notionwide	33
CompuAdd	nationwide	8
Intelligent Electronics	Northeost	8
Inacomp	not onnounced	6
Micro Center	Midwest/ Southeost	5
Fry's	California	3

JEFF BERLIN

Superstore chains are branching out across the U.S., with 78 outlets expected by year-end, according to Merrin Associates. While traditional dealers struggle, revenues for superstores will more than double this year to $2.8 billion.

Small Businesses Struggle Into Windows

A Minefield of Problems Waiting to Be Discovered

When Udo Winkler picked up a copy of *Windows 3.0* for his laptop last fall, he had no inkling of the trouble in store. Winkler, a wholesale hardware salesman who works from his home in Running Springs, California, couldn't get past the second *Windows* installation disk on his TurboSPort 386.

During the next ten weeks he called Microsoft's *Windows* support line repeatedly, only to remain on hold for 45 minutes or more each time before hanging up in disgust. Finally, after holding on for an hour and 20 minutes, he reached a technician who promised to call back but never did. In frustration, Winkler complained to several magazines; that expedient produced a call from Microsoft, and, at last, a solution to his installation woes.

Well, sort of. Microsoft could guide him through installation, but only if *Windows* was installed in CGA mode—a crippled configuration. The company also informed Winkler that his troubles lay in the computer's BIOS rather than Microsoft's package. Still, Winkler is bitter. "I spent the money for all these products, and they just kind of dropped the ball," he says. Winkler estimates he's spent more than $150 on phone charges to Redmond. He's still trying to get through to Zenith for a BIOS upgrade, and he can't run *Windows* yet.

Udo Winkler spent more than $150 on phone calls to Microsoft, but Windows still won't run acceptably on his laptop.

STEVE GOLDSTEIN

Small Companies, Big Snags

Winkler's problem is extreme but not uncommon: As one of the first widely sold protected-mode packages, *Windows 3.0* reveals incompatibilities and bugs in BIOSes, drivers, and applications that previously passed undetected. Large companies that have considerable support resources take these snags in stride, but smaller firms can't. And when things go wrong, they blame Microsoft.

Factor in *Windows* sales that have surprised even Microsoft, and you get a phone support nightmare. "I can appreciate how frustrating that is," responds *Windows* product manager John Roberts. He reports that the company has nearly tripled phone staff since last year and launched several programs this spring aimed at delivering key installation and configuration tips to users, including a 20-page magazine sent to all registered users, free workshops held around the country, and a $14.50 resource kit.

"We realize that people are experiencing migration issues, and we have answers," says Roberts. He hopes that by giving users more tools and information, they'll diagnose more problems on their own.

He also says that PC manufacturers need to address incompatibility problems. Jordan Rosenberg, consultant and cofounder of the user group San Francisco Business Computers, agrees. "I had a hell of a problem with *Windows* and my Plus Hardcard driver, and [Plus] doesn't tell you until you call....Whoever knew about the problem, Microsoft or Plus, should have told me." He gives Microsoft the benefit of the doubt, explaining that "they have always treated me very well as a customer."

Not for Novices?

Most problems arise for users still struggling to understand how their computers work, says Carole Patton, editor of *ACKnowledge, the Windows Letter* in Mendham, New Jersey. "Anybody who understands memory and networking is not going to have problems," she maintains. Jim Weiler, director of the Boston Computer Society's *Windows* group, believes that Microsoft isn't the best place to go for hand-holding. "So many people are getting into *Windows*, and they don't know that they need support until it's too late. I tell them that CompuServe is the best source of information."

Nevertheless, a small business that can't afford to spend a lot of time on CompuServe *Windows* forums or pay for third-party support may fall through the cracks. The bottom line, Patton stresses, is that *Windows* may be too sophisticated for such firms. "I don't see *Windows* being a success with smaller companies for a year or two, until all the complexities are covered up." —*Scott Spanbauer*

Stumbling Blocks for Windows Users

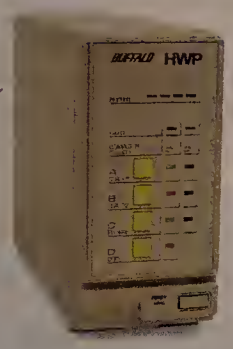
A sampling of start-up problems and solutions

Problem	Potential solution
Incompatible system BIOS	OK Replace BIOS if possible
Incompatible display, hard disk	OK Replace device driver if possible
Doesn't run on network	OK See if Microsoft or network vendor offers work-around. (Some popular nets not supported.)
SmartDrive won't work with disk-partitioning software	OK Partition disk using DOS 4.0, or don't use SmartDrive.
Difficulties installing DOS applications	OK Learn PIF file procedures. Get help for specific configuration from suppliers or other users.
Difficulties running memory-hungry DOS applications	OK Add, reconfigure memory. Consider third-party 386 memory managers.

Users report many hurdles in installing and configuring Windows. While Microsoft offers various resources, asking your peers or joining a CompuServe forum may afford a quicker solution.

Printer Sharing Solutions

5 or 10 Ports



- *Reliable Automatic Switching*
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- *No PC RAM Memory Required*
- *Toll-Free Technical Support*
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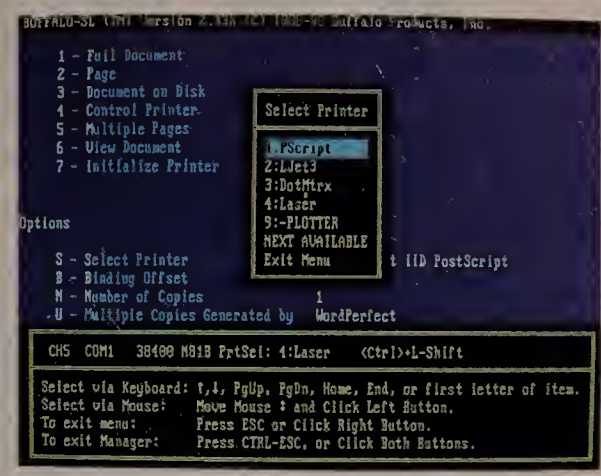


HWP — *5 Ports*

HWP-256	with 256KB	$325
HWP-512	with 512KB	$375
HWP-1000	with 1MB	$425

User Upgradable Memory:
From 256KB to 16MB buffer

Input/Output Settings – 4/1 or 3/2:
All parallel ports; user configurable as either three inputs to two outputs, or four inputs to one output, buffered auto-switch

Rapid Data Transfer – 100,000 cps:
The HWP uses Direct Memory Access (DMA) for data transfers into the buffer, making the HWP hardware capable of receiving parallel data at the high rate of 100,000 characters per second.

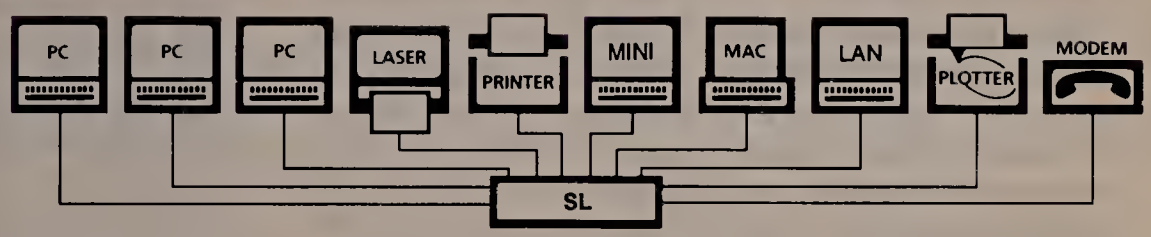
Pop-up Menu or Front Panel Buttons:
Use either the pop-up menu or the front panel switches to select printers, select the next available printer, send multiple copies, clear data, and other functions.

AS-41 — *5 Ports* — *$200*

Smart Switch – No Pop-up or Buffer:
Four parallel inputs to one parallel output, electronic automatic switch with no buffer

SPPS — *(not shown)* — *$100*

Interface Converter – No Buffer
Combination serial-to-parallel, or parallel-to-serial interface converter in a single unit; low-power CMOS design derives power from serial connection, no power supply needed; supports 9,600 to 115,200 bps, DIP switch configurable



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The SL is the peripheral sharing solution which enables everyone to share lasers, printers, plotters, and modems. The HWP is ideally suited for sending large graphics files, but is economical enough for any kind of printing within a small workgroup.

Greater access by more users reduces unproductive idle time and the expense of purchasing additional peripherals. With a buffer, all users can simultaneously send print data and quickly release their PCs to continue working.

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SL or SLP — *10 Ports*

SL or SLP-256	with 256KB	$495
SL or SLP-512	with 512KB	$575
SL or SLP-1000	with 1MB	$675

Two Configurations – Ten Ports Each:
SL – four parallel and six serial ports
SLP – eight parallel and two serial ports
Both include 15 ft. serial null-modem cable

User Upgradable Memory:
From 256KB to 4MB buffer

Any Combination of Printers or PCs:
All ten SL or SLP ports can be software configured as either input or output.

Automatically Routes and Buffers Data:
Automatic switching and queuing of jobs; automatically converts data from parallel-to-serial or serial-to-parallel

115,200 bps PC-to-PC File Transfers:
Transfer files serially between PCs up to 115,200 bps; buffer serial data to the SL several times faster than normal 9,600 bps

Pop-up Menu via Hotkeys or Mouse:
Keyboard selection of printers and many other control functions; pop-up is for convenience, but is not required

Simple Installation:
Plug in your cables; if desired, run the installation software for the pop-up menu

PostScript Stays Standard

Adobe Expands Font Capabilities

Starting late this year, you'll be able to take special PostScript fonts and manipulate them almost at will—altering size, weight, width, and style—and they won't lose their good looks.

This is the promise of Adobe Systems' Multiple Master technology, hailed by analysts and users alike. "For professional designers, it adds a level of control to publishing that has been missing since the advent of electronic type on the PC," comments Joseph Prieboy, consultant for Home Box Office in New York City.

Multiple Master technology also demonstrates Adobe's determination to hold its ground in high-end printing—and to create spin-offs that ease user headaches in general.

For instance, notes Adobe chairman John Warnock, take the letter or worksheet that doesn't quite fit onto a single page—with these malleable fonts, you can condense or expand the type so it fits neatly with no loss of quality. Or when someone sends you a document formatted with a font you lack, you normally must fix it manually to make it print out properly. But a Multiple Master font could automatically mimic the original font's exact size so that the document printed out in fine style. "This will have a huge impact on the way we communicate with each other," Warnock predicts.

Technology and Partnerships

Over the past two years, Adobe has been feeling pinched between Hewlett-Packard LaserJets and compatibles, which sell at much higher volume than PostScript devices, and a strange-bedfellows partnership between Microsoft and Apple at the high end. The Mountain View, California, firm has held its territory partly through advances such as Multiple Masters, better color support, and upcoming fax integration products. More important has been friendlier relations with other vendors—including lower licensing fees.

Apple, Epson, and HP are among the major players introducing PostScript products this year. RISC-powered designs have helped to overcome PostScript's nagging performance limitations. Hordes of LaserJets and compatibles go out the door with a PostScript cartridge—a trend that will be bolstered by new network-oriented printers. Even PostScript compatibles, like the PhoenixPage embedded in Pacific Data's fast-selling cartridges, end up as a net plus for the PostScript standard.

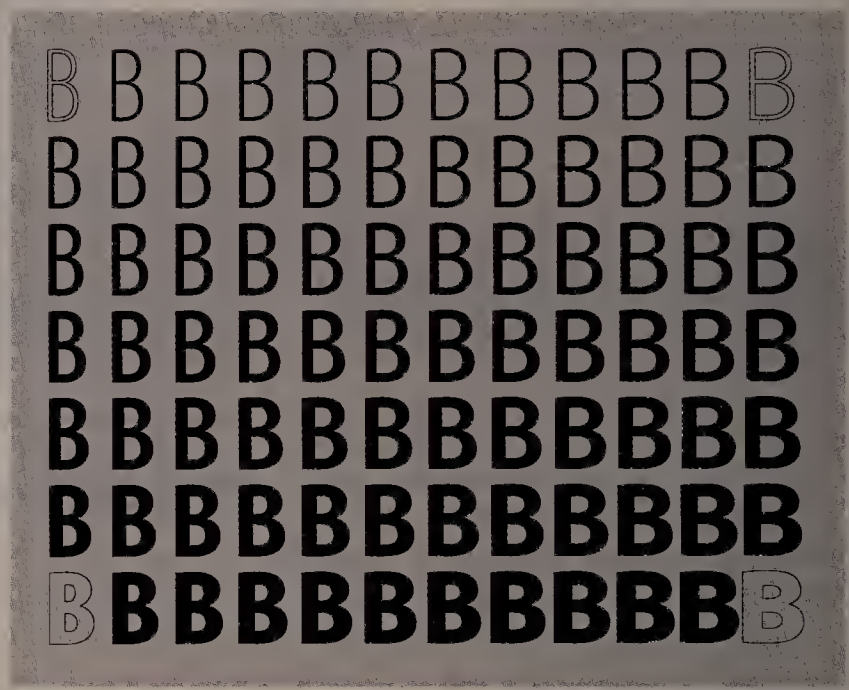
"A lot of vendors see PostScript as a way around HP," comments Carolyn Perrier, product manager for non-impact printers at Epson America in Torrance, California. "PostScript printer prices will continue to erode very rapidly."

TrueType to Your Word

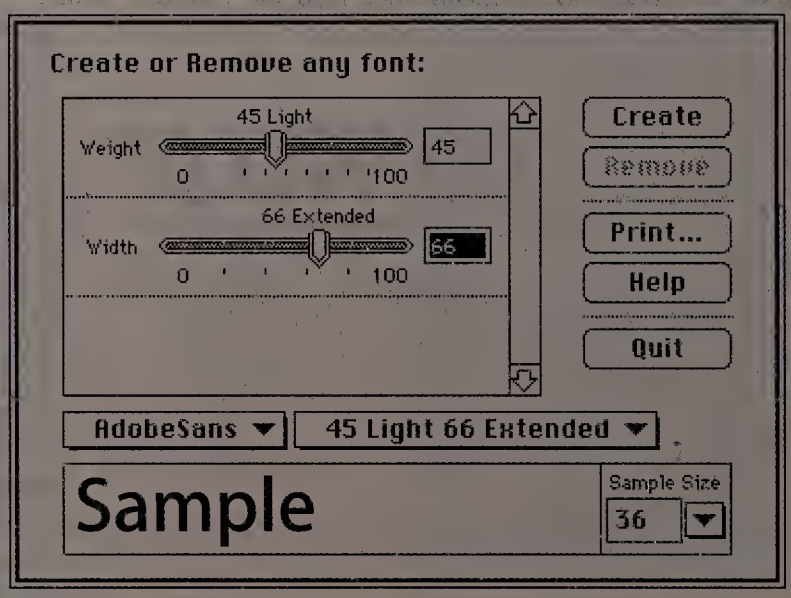
Adobe's biggest challenge remains TrueType and TrueImage, the rival font/page-description-language combo from Microsoft and Apple that will run on today's PostScript devices. The challenge has remained purely verbal for much longer than expected. Apple finally shipped its first TrueType products in March (and fell on its face due to surprising installation problems). For the PC, TrueType will most likely celebrate its second birthday as vaporware in September.

But when *Windows 3.1* finally ships, the rules of the game will change because TrueType will be included free. "If you get in the *Windows* box the same 13 fonts that Adobe ships, why go out and buy them from Adobe?" asks Dennis Adler, manager of Microsoft's type effort. "TrueType will be widespread on Intel and Mac platforms, probably mostly at the low end," predicts Jonathan Seybold of *The Seybold Report on Desktop Publishing* in Malibu, California.

However, while users are intrigued by TrueType, they're wary about calls for new hardware. "PostScript is the one standard we use around the company for professional graphics," Joseph Prieboy says. "I don't care whether my users want PostScript or TrueType fonts," says another corporate user. "I *do* want to buy one printer environment through the corporation." —*E. B.*

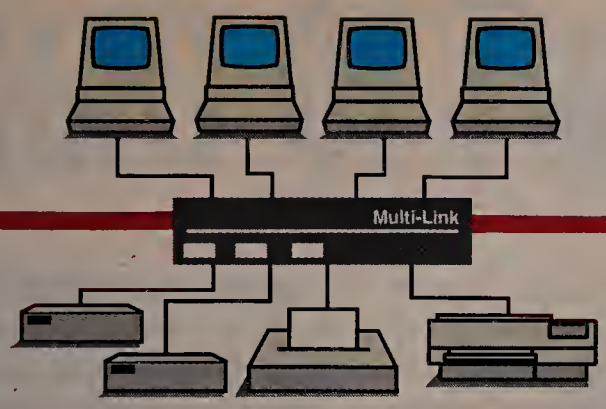


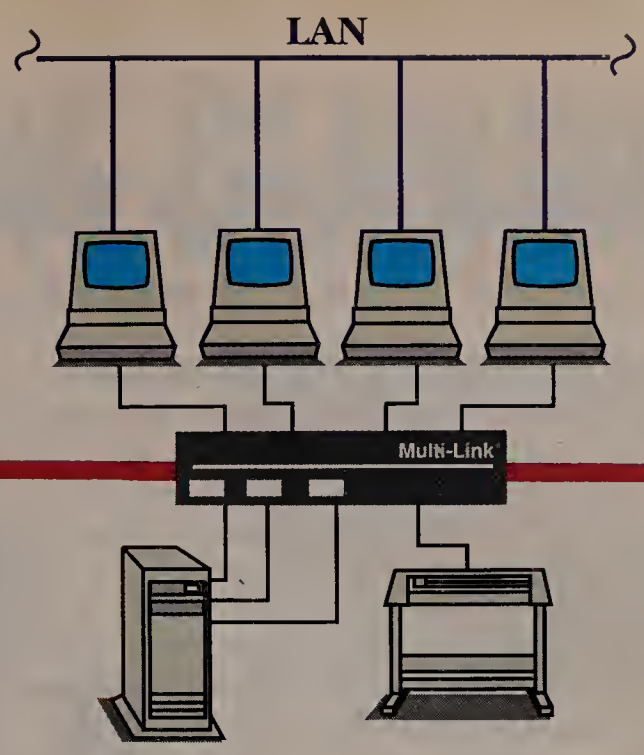
Adobe's Multiple Master technology is designed to give you almost unlimited variations on a given typeface. Here, the system can generate any combination of weight and width between four "master" fonts.



Upcoming PostScript font software will offer users unprecedented flexibility, as this Macintosh prototype shows.

Alice LaPlante is a freelance writer in Palo Alto, California, and Scott Spanbauer is a PC World *contributing editor.*





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Circle 325 on reader service card

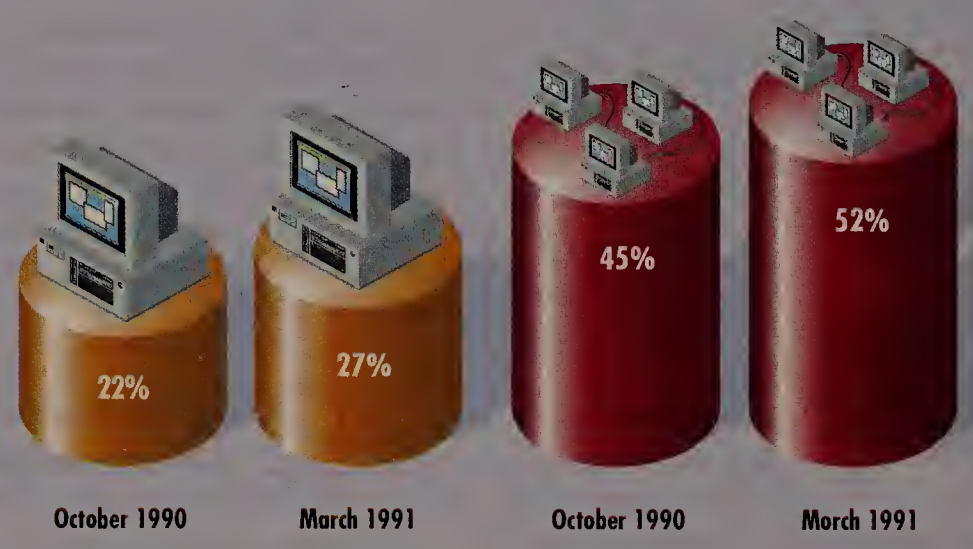
Changing Trends in Windows 3.0 Use

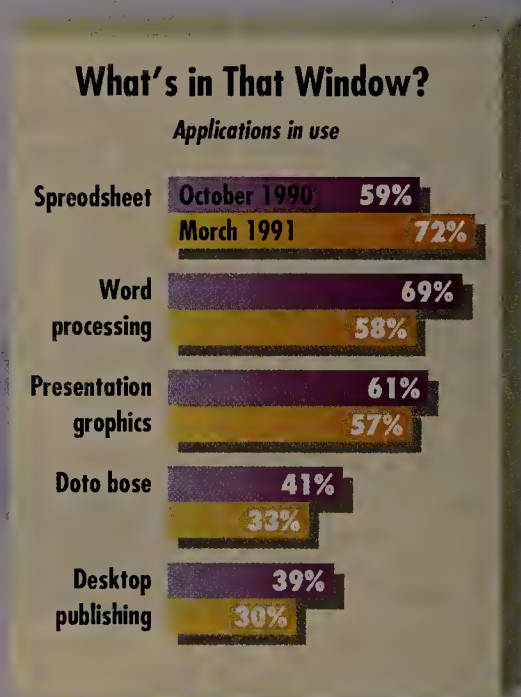
Exclusive PC World Surveys Chart Windows Use and Satisfaction

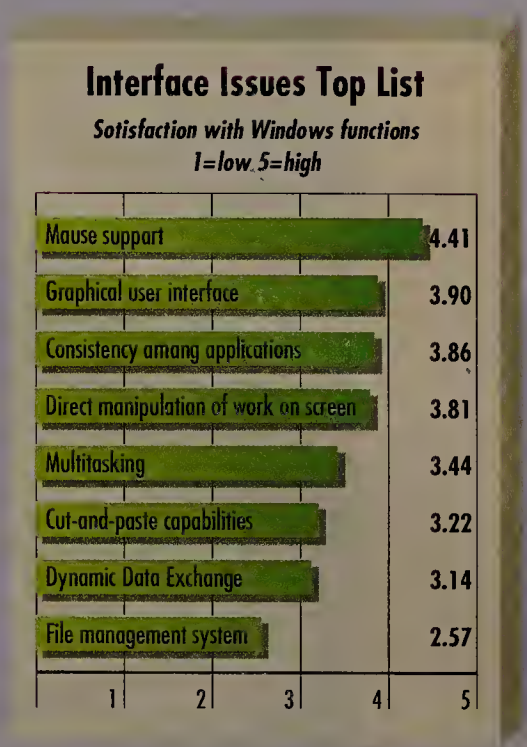
Businesses are latching on to *Windows 3.0* in a big way, according to two surveys of *PC World* readers. More than half of all respondents report that their companies are running the operating environment. Personal use is lagging behind, however, with fewer than one-third of the readers surveyed using *Windows* themselves.

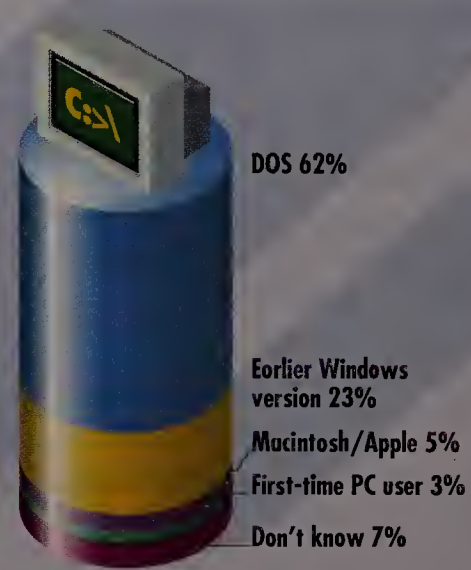
Word processing packages, which boasted the largest installed base of all applications run under *Windows* last October, have moved to the number two position behind spreadsheets. A whopping 72 percent of readers surveyed run their spreadsheet under *Windows* (although not all of them are running *Windows* spreadsheets). Over 75 percent of respondents are running *Windows* on a 386-based system, with only 15 percent using a 286, which Microsoft identifies as the minimum system required.

According to our survey, *Windows'* more basic interface features rate highest in user satisfaction. The relatively low ratings of some of the high-end functions reflect the fact that a full 62 percent of *Windows* users surveyed moved to Microsoft's graphical environment from plain old DOS and are likely still getting used to the *Windows* way of computing. —*Roberta Furger*









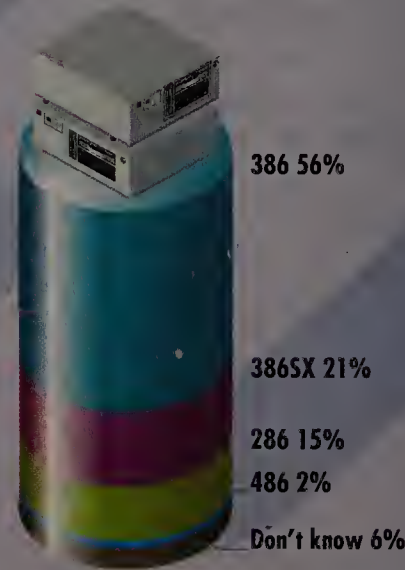


Chart data based on two surveys of 250 PC World readers conducted in October 1990 and March 1991.

JEFF BERLIN

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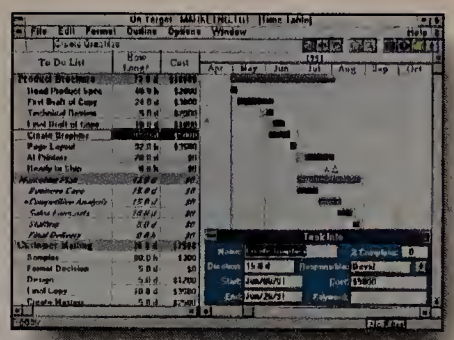
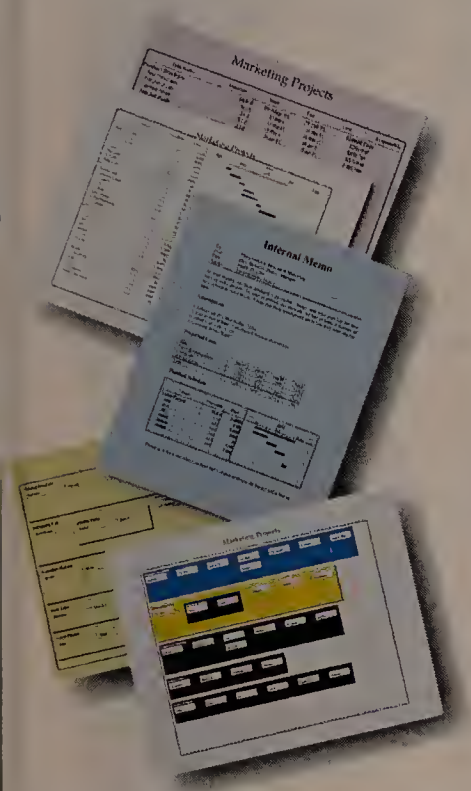
Project Calendar™ *presents your schedules in a familiar calendar format—and that's just one of the many On Target reports.*



On Target is designed specifically for Windows™ 3.0. Its graphical user interface, familiar spreadsheet format, and full color WYSIWYG graphics make project planning easy.



On Target creates a number of different reports. You can also copy graphics into other Windows applications.

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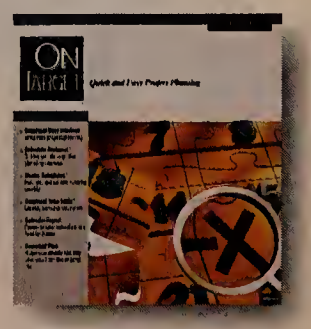

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PC WORLD STREET PRICE LIST

What to pay at retail for PCs, based on IDC's PC Pricing Report survey.

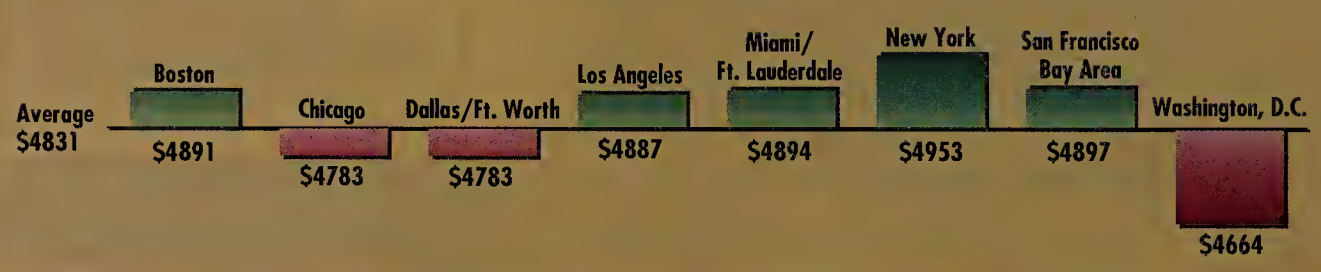
PC WORLD

	National				Metropolitan							
	List	Average	Low	High	Boston	Chicago	Dallas/Ft. Worth	Los Angeles	Miami/Ft. Lauderdale	New York	San Francisco Bay Area	Washington, D.C.
80286-based desktop PCs												
AST Bravo/286	$1695	$1268	$895	$1500	$1329	$1283	$1298	$1182	$1400	$1385	$1151	$1290
Compaq Deskpro 286n	$2399	$1809	$1295	$2176	$1805	$1753	$2008	$1586	$1947	$1866	$1720	$1787
Dell 210	$1400	$1400	$1400	$1400	$1400	$1400	$1400	$1400	$1400	$1400	$1400	$1400
IBM PS/2 50 Z-031	$2745	$2016	$1399	$2470	$2019	$2045	$2014	$1839	$2187	$2004	$1851	$2100
Tandy 2500 XL/2	$1959	$1959	$1959	$1959	$1959	$1959	$1959	$1959	$1969	$1959	$1959	$1959
80386SX-based desktop PCs												
AST Bravo/386SX	$2845	$2121	$1779	$2495	$2196	$2190	$2280	$2020	$2296	$2241	$1908	$2129
Compaq Deskpro 386s	$2999	$2402	$1900	$2890	$2447	$2400	$2670	$2276	$2521	$2402	$2298	$2291
Dell System 316 SX	$1600	$1600	$1600	$1600	$1600	$1600	$1600	$1600	$1600	$1600	$1600	$1600
Epson Equity 386SX Plus	$2999	$1726	$1295	$2150	$1718	$1870	$1917	$1562	$1756	$1695	$1645	$1742
IBM PS/2 55-061	$3295	$2628	$1999	$3223	$2594	$2548	$2737	$2557	$2704	$2711	$2371	$2700
NEC PowerMate SX+	$2149	$1907	$1499	$2550	$1835	$2043	$2033	$1951	$1830	$2088	n/a[1]	$1960
80386DX-based desktop PCs												
AST Premium 386/25	$5595	$4056	$3149	$5000	$4004	$4233	$4098	$3835	$4650	$4511	$3704	$4159
Compaq Deskpro 386/33L	$7999	$6220	$4999	$7874	$6605	$6319	$5815	$5766	$5997	$6362	$6300	$6063
Epson Equity 386/25 Plus	$4999	$3481	$2679	$4249	$3581	$3658	$3678	$3375	$3500	$3580	$3601	$3125
IBM PS/2 70-061	$4745	$3406	$2950	$4270	$3378	$3474	$3411	$3208	$3420	$3625	$3101	$3175
IBM PS/2 70-A61	$6245	$4728	$4285	$5620	$4686	$4693	$4736	$4690	$4991	$5028	$4309	$4602
Tandon 386/33	$3079	$3079	$3079	$3079	$3079	$3079	$3079	$3079	$3079	$3079	$3079	$3079
Tandy 4033 LX	$5898	$5898	$5898	$5898	$5898	$5898	$5898	$5898	$5898	$5898	$5898	$5898
80486-based desktop PCs												
AST Premium 486/25E	$8595	$6362	$4799	$7500	$6756	$6503	$6450	$5987	$6586	$6661	$5722	6512
Compaq Deskpro 486/33L	$10,999	$8872	$7127	$11,391	$9039	$9397	$8905	$8176	$8282	$8849	$8999	$8403
Dell 425E	$5700	$5700	$5700	$5700	$5700	$5700	$5700	$5700	$5700	$5700	$5700	$5700
IBM PS/2 95 XP	$17,745	$13,113	$10,650	$15,500	$12,580	$13,223	$14,206	$12,609	$12,920	$13,063	$13,105	$12,600
NEC PowerMate 486/25E	$9899	$6665	$5500	$7919	$6899	$6688	$7450	$6360	$6563	$6407	n/a[1]	$6444
Portables/laptops												
Compaq LTE/286	$3499	$2555	$2049	$3000	$2654	$2576	$2593	$2494	$2633	$2558	$2446	$2456
Compaq LTE 386s/20	$6499	$4831	$4290	$5975	$4891	$4783	$4783	$4887	$4894	$4953	$4897	$4664
Dell 320LT	$3799	$3799	$3799	$3799	$3799	$3799	$3799	$3799	$3799	$3799	$3799	$3799
Epson Equity LT-386SX	$5598	$3563	$2995	$4249	$3517	$3824	$3551	$3065	$3301	$3460	$3645	$3766
IBM P70 386	$7695	$5793	$4179	$7000	$5641	$5784	$5849	$5465	$5708	$6212	$5410	$5521
Toshiba T1000SE	$1499	$1055	$798	$1350	$1101	$1114	$1130	$1002	$1023	$966	$979	$1132
Toshiba T3100e	$3699	$2707	$2199	$3300	$2863	$2771	$2834	$2701	$2795	$2432	$2699	$2799

From an IDC survey of more than 180 computer dealers in eight metropolitan areas. Figures based on at least four price quotes for each machine. Prices are based on manufacturer's standard configuration without monitor. [1]Due to the limited number of NEC dealers in the San Francisco area, IDC was unable to collect enough price quotes.

Big-Apple Buyers Pay Big for Compaq Notebook

Retail pricing for Compaq LTE 386s/20 in eight metropolitan regions



While New York is usually hard to beat when you're shopping for any kind of electronic equipment, it produced the worst prices for Compaq's hot-selling LTE 386s/20 in IDC's March survey.

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EDITOR'S CHOICE
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Compaq Deskpro 386S	4.48	9.67

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24 Hours a Day,
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Reason #1
"Overall Excellence."

As *PC Magazine* said "Price is always a consideration. So are benchmark test results. But both factors can be deceiving, which is why we consider them in the context of other aspects that will make the difference months and years down the road."

These are the attributes which *PC Magazine* used in awarding ZEOS the coveted Editor's Choice, not once but *seven* times. And "Overall Excellence" are the very words *PC Magazine* used in describing ZEOS systems comparing them to all others.

Reason #2
Dazzling Performance.

In one recent '386 review, *PC Magazine* awarded ZEOS Editor's Choice. "The ZEOS '386 blows away every other computer... a smart choice" is what they said. And in another recent review, *Government Computer News* said the ZEOS 33MHz '386 is "arguably the fastest MS-DOS and OS/2 micro in the world."

Dazzling Performance is built into every ZEOS system. It's a key component of ZEOS Overall Excellence.

Reason #3
Exceptional Quality.

PC Resource Magazine put it this way, "ZEOS... provides quality comparable with IBM or Compaq and does so for about 70% of the price." ZEOS uses only the very best components. And every system is fully tested and burned-in right in our own labs.

Reason #4
Value.

InfoWorld says, "We find the ZEOS '386 an excellent value. Speed: Excellent. Compatibility: Excellent. Value: Excellent." *Personal Computing* said, "ZEOS... is the best value we've come across... its performance is right up there with the slickest, most expensive PCs you can buy."

Reason #5
Warranties and Guarantees.

ZEOS believes in its products. That's why we offer each and every customer our 30 Day Absolute Satisfaction Money Back Guarantee, no questions asked. Plus, our One Full Year Limited Warranty and Express Parts Replacement Policy. Optional On Site Service is available too. Call for details.

Reason #6
24 Hour Toll Free Technical and Sales Support.

At ZEOS, the customer is #1. That's why we invented 24 Hour a Day Tech Support. For *your* convenience. If you buy a product from us we feel we should be there to help, any time of the day or night. Give us a call Toll Free! 800-423-5891. Anytime!

Reason #7
Experience.

Almost unique in the mail order computer industry, ZEOS maintains its own chip level Research and Development staff. In addition to Systems Manufacturing, we also operate our own Board Level Manufacturing facility.

ZEOS has been involved in Research and Development since our incorporation back in 1981. Our strong and experienced Research, Manufacturing and Technical Staff translates into superior factory direct computer systems for you.

Reason #8
A Sterling Reputation.

In magazine after magazine and review after review ZEOS systems are cited for Overall Excellence, for Excellent Value, as the Right Choice and so on. All of this is flattering but the most important thing is this: What do our customers think? Frankly, they love us. The systems and the support. That means more to us than anything.

Reason #9
Easy to Buy.

ZEOS systems are easy to buy. You can pick up the phone any time of the day or night and order your new ZEOS computer. And we accept MasterCard, Visa, Discover, American Express, and Corporate Purchase Orders from Fortune 1000 Companies, Colleges, Universities and Governments. Complete Leasing Programs are available as well.

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Reason #10
You're Going to be Very Satisfied.

When it comes right down to it, you're going to be very satisfied with your new ZEOS system. Our goal is your complete satisfaction. And that's our commitment to you. To quality. To performance. To reliability and support. To *Value.* We don't just say it, *we Guarantee it!*

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TWO-FISTED MANAGEMENT

MARK MAREK

DUE TO THE STRONG GRAPHIC CONTENT OF THIS PROGRAM, USER DISCRETION IS ADVISED.

We don't want to infringe on anyone's freedom of expression. But Charisma gives you so many graphic possibilities in one powerful, Windows-compatible program, we felt a warning was necessary.

Limit the number of fonts used to no more than two per presentation. Be consistent and use underlines, italics or bold type for emphasis.

Once you try it, you'll understand why. Charisma's extensive word and data charting functions, real drawing capabilities and total user control make it the most complete graphics solution for business. Unfortunately, some people have trouble resisting the temptation to use every Charisma feature on every presentation. That's understandable. When you have access to 16.8 million colors, more than 40 fully editable fonts, thirteen drawing tools, a library of 2200 clip art images and the ability to turn any graphic element into a bullet, it's easy to get a little too enthusiastic.

It's just as easy to get overly excited about the way Charisma lets you assemble entire presentations without switching between word processing, graphics and spreadsheet programs. Plus you see the results of your creativity immediately, since Charisma doesn't make you go back and forth between text and graphic screens. And with more than 30 import and export filters for graphic formats—including Harvard Graphics—Charisma gives you more power and control than ever before.

Add visual interest and keep audience attention focused with freeform illustrations or custom edited clip art. One graphic per chart works best.

Break out information logically and understandably with a variety of chart types. Then use the Harmony Palette for a unifying blend of just the right colors.

But you shouldn't expect any less from a program designed specifically to take full advantage of the Windows environment. Now, even without overdoing it, you can output the most provocative business graphics you've ever seen to 35mm slides, overheads and handouts. Or make your point with SlideShow, Charisma's on-screen graphics presentation utility that includes dozens of transition effects.

As you lay out word charts, use a template that provides maximum readability. Add spark to presentations by turning any graphic element, even your company logo, into a bullet.

Its strong graphic content prompted *InfoWorld*'s Michael J. Miller to say, "Charisma offers the greatest flexibility in creating and editing charts that I've seen."

We think you'll agree.

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*Allow 4-6 weeks for delivery. Micrografx, Inc. 1303 Arapaho, Richardson TX 75081 - (214) 234-1769 (customers outside North America please dial extension 3710). Micrografx has offices in Los Angeles, Paris, London, Munich, Sydney and Copenhagen.

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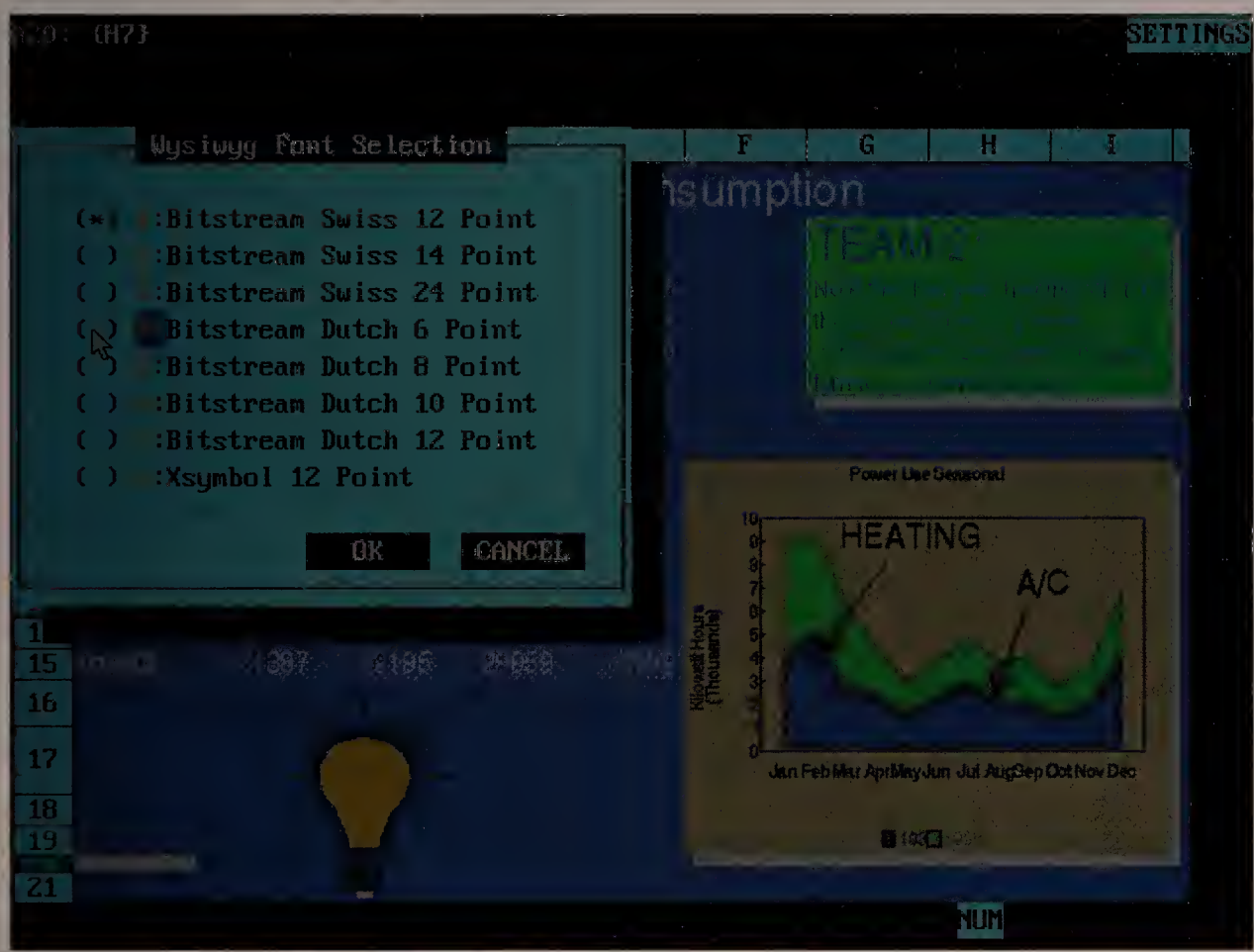
1-2-3 Dresses for Success

Release 2.3 boosts the all-time best-seller with major add-ins, enhanced graphs, and other much-needed improvements.



The new 1-2-3 sports the most compliant spreadsheet interface this side of Windows. You can put live graphs beside your data, import CGM graphics, and dress up reports with fancy fonts.

Richard Scoville

For years Lotus has struggled with a tricky riddle: How can you revamp the world's best-selling computer program without changing its classic command structure?

Lotus's current answer: add-ins. Graft a few features to the core *1-2-3* engine, then attach some serious accessories—a WYSIWYG graphical user interface just like release 3.1's, with on-board draw program, text editing, and styles; the file management Viewer from Lotus's *Magellan*, and an Auditor to help you unravel tangled formulas. Then, make it run fast in as little as 512K of memory.

The new release 2.3 narrows inconsistencies between Lotus's low-end and high-end DOS spreadsheets. Release 2.3 is essentially a subset of *3.1*, with all of *3.1*'s presentation skills but without its advanced data base or 3-D worksheets. (Lotus will ship a *3.1+* upgrade concurrent with *2.3* and at the same price. It includes the Viewer, the Auditor, a few new graph options and printer drivers from *2.3*; and the Solver technology from *1-2-3/G*.)

1-2-3 users will encounter few surprises in release 2.3. The command structure of the core program is basically unchanged, except for some new graph options and a few other minor additions. The screen has gained a white background, and the frame headings indicate the current row and column position (as in release 3.*x* and *Quattro Pro*).

WYSIWYG Is Good to Get

As with the new *Quattro Pro*, the big news for *1-2-3* is a WYSIWYG interface. Instead of *Windows*-like pulldown menus, release 2.3 retains Lotus-style menus, with mouseable, more extensive setting sheets. (Lotus aficionados will find this approach a natural extension of what they're doing, but novices may find the menu tree initially hard to grasp.) But *2.3* turns out to have the most compliant graphical user interface this side of *Excel*, with a flexible spreadsheet publishing system and good speed-up tools.

The interface is attractive and handles well when you're scrolling or mousing. Mouse operation of commands and settings sheets is smooth and fast. For instance, you can select a range with the mouse, then execute several commands on the same range. You

SNAPSHOT

1-2-3 for DOS release 2.3

Add-ins boast the most popular spreadsheet's power and usability.

KEY FEATURES

- **WYSIWYG interface**
- **Improved graphs**
- **Magellan-style file Viewer**
- **Auditor to analyze worksheet formula structure**
- **Background printing**

AVAILABILITY

May 1991

PRICING

$495, upgrades $150

Lotus Development Corp.
55 Cambridge Pkwy.
Cambridge, MA 02142
800/343-5414

Reader service no. 706

can also adjust row height and column width.

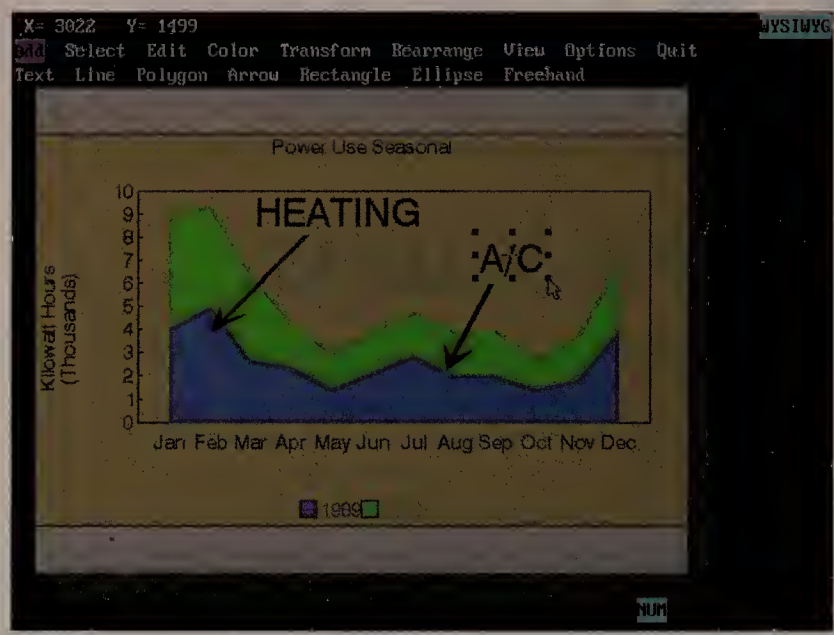
What-you-see is impressive; so is what-you-get. You can control the font, including boldface, italics, and underlining; three Bitstream fonts are provided. You can attach a live graph or an external CGM file to a worksheet range, then edit the graph or image with a built-in draw program that looks and feels like Lotus's *Freelance*. You can add text, rectangles, lines, and other vector elements; rotate objects; and arrange them in layers.

A text editor lets you define a "page" within a worksheet range; in this page you can enter and edit text, complete with justification control and other enhancements. A nifty shortcut lets you center titles at the top of a report. In addition, you can put lines around cells, shade them, and add drop shadows.

Fancy formatting gets tedious if there's no way to automate the process. Release 2.3's format styles let you assign a name to a collection of settings, then apply those settings quickly to additional ranges. As with *Excel*'s Copy Special command, you can also copy format characteristics from one range to another.

More Generous Graphs

The new graphics features are a subset of release 3.1+'s and almost a match for *Quattro Pro*'s lineup. You can choose high/low graphs, mixed-line and horizontal bar charts, and area display for line graphs. Three-dimensional effects are available for bar charts. You can display the *y*-axis on both sides of the graph, but you can't set up two independent *y*-axes. You can suppress display of selected sides of the graph frame, and you can choose whether to leave a margin between the frame and the first data point. As it does with range names, release 2.3 generates a table of graph names for reference and macro use.



You can enhance your graphs with a Freelance-like drawing tool that lets you add text and annotations, control color, and align objects on a grid.

These are welcome additions, but there's still work to be done, at least on the beta version: *Y*-axes and frame edges are confusingly referred to as "left" and "right," but when you rotate the graph to horizontal, "left" becomes the bottom and "right" is on top.

The View From the Disk

The Viewer add-in is based on Lotus's much-acclaimed *Magellan* file manager. It lets you peek inside worksheets on disk, select a cell to build a linked formula, or browse ASCII and *1-2-3* text files. In contrast to the regular *1-2-3* File commands, the Viewer provides excellent point-and-shoot navigation of directories, and you can use cursor keys to move around inside a displayed worksheet. It represents another grafted-on user interface, but one that's simple to understand.

However, the Viewer's features could go a great deal further. Why not let us navigate with <F5> (Go To) and <F3> (Range Names) in the displayed worksheet, or select and copy cells from the disk sheet to the screen clipboard?

Sounding Out Formula Errors

Many a hapless spreadsheeter has foundered on formula shoals. But with *1-2-3*'s Auditor add-in, help is near.

In your efforts to trace formula errors, the Auditor lets you select a formula, then identifies all the cells to which the formula refers. Or you can pick a cell, and the Auditor will find the formulas that refer to it. It can highlight the resulting cells, move the cell pointer to them, or list the results as a table in your worksheet. It also identifies circular references and traces the recalculation order of formulas.

The Auditor sounds great, but it's no panacea for sloppy work—just a way to make the hitherto impossible task of finding formula errors merely onerous. *Quattro*'s auditor works about as well; neither is as agile or useful as an *Excel* Info Window, which has notes, references, and dependent cells that show you where you are in the formula process.

The Little Extras

Other features make life a little easier. The settings sheets from release 2.2 have been groomed and extended. And they work well: For operations such as printing, graphing, sorting, and global settings, you get a near-full-screen display of current options. Settings sheets are mouseable in WYSIWYG or character mode. If you don't have a mouse, press <F2>, and edit selections inside the settings sheet instead of proceeding with the normal *1-2-3* menus.

One subtle but important enhancement is that the program lifts the restrictions on expanded memory that have waylaid users of big worksheets. You can elect to store both data and cell tables in expanded memory, thus increasing the maximum size of your worksheets.

Another welcome change: *1-2-3* alerts you if you're about to retrieve a worksheet without saving your current one.

Background printing is available, but you must load a memory-resident utility before entering *1-2-3*. You get improved printer control with print preview and an automatic compression feature that shrinks a large print range onto a single page, and you can change the worksheet frame into a ruler. And release 2.3 supports PostScript.

Spreadsheets Do Battle

1-2-3 release 2.3 lacks *Quattro*'s complex interfile formulas, external data base links, and goal seeking, but users interested in those capabilities should make the comparison with *1-2-3* release 3.1+.

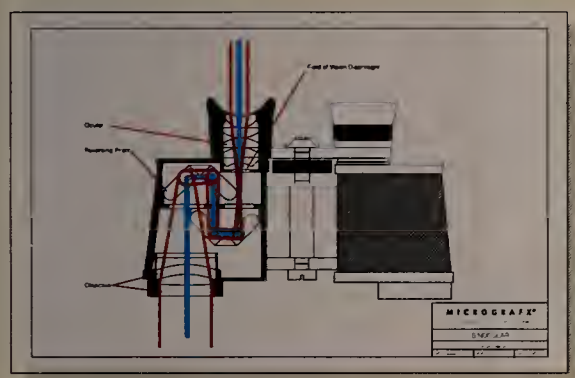
2.3 offers most of the features on a spreadsheeter's wish list. Its WYSIWYG interface is smooth and tractable, it offers formatting timesavers, and its settings sheets are comprehensible. If you want a slick graphical interface to add flavor to your number crunching, *2.3* is worth a taste.

Richard Scoville is a contributing editor for PC World.

New! 3.1 Release Free Trial Software

Focus on Precision Illustration With New Designer 3.1

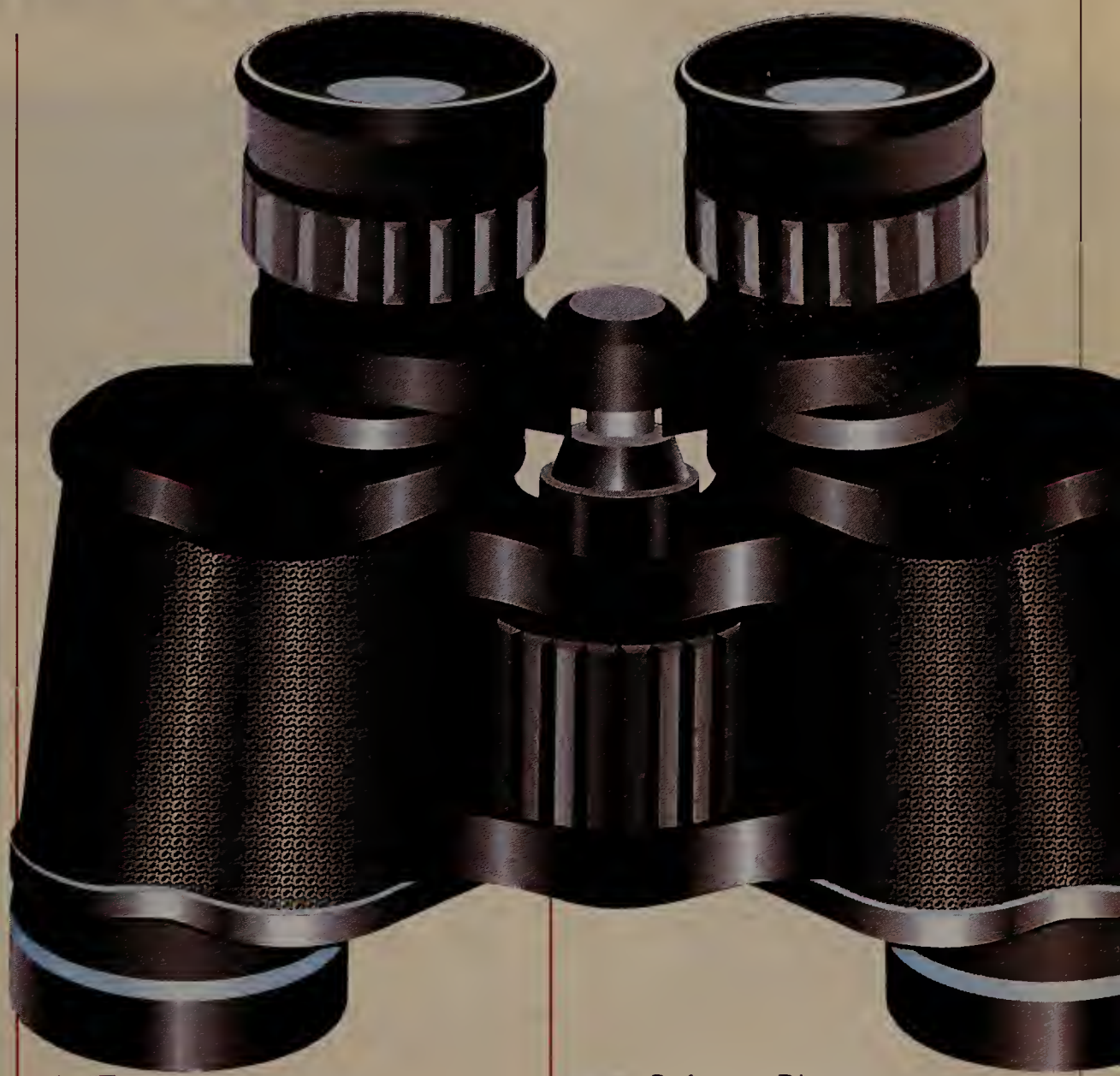
See for yourself. New Designer 3.1 turns your PC into a precision illustration tool, running under the Microsoft® Windows™ environment. You'll get more accuracy in technical illustrations, greater performance in graphic designs and higher speed in desktop publishing layouts. It's now easier to turn what you can imagine into an image all can see. Call for your free trial software and feel the high performance yourself.



▲ *Higher performance in Designer 3.1 speeds up drawings with faster wide styled lines–even wide dashed lines. Object snap points make precision a given.*

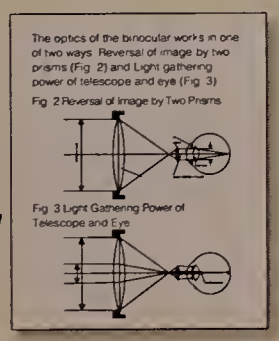
The view from out front. With new Designer 3.1 you're ahead of the pack no matter how you look at it. With more usable features, higher performance operation and more flexible file handling, you'll be able to create and manipulate an image until it's just right. That's precision.

▲ *Choose from 16.4 million colors and save any number of custom palettes for later use. Combine text and graphics with bitmapped images and true layering.*



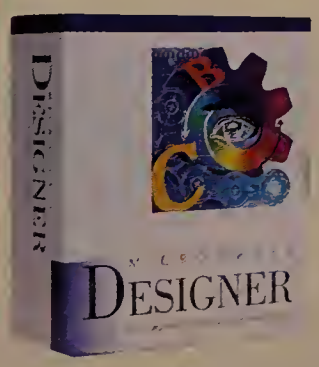
▲ *"The power-users choice . . . a customizable toolbox has a tool for just about anything; precise and accurate autotracing utility, CAD-like layering and superb color-publishing capabilities," says PC Magazine.*

▶ *Desktop published articles become clearer with precision illustration from Designer 3.1. Multiple file formats speed up import and export of files.*



Outside perspective reflects well. "Designer is an outstanding illustration package that receives Editor's Choice recognition. Designer is perhaps the most sophisticated of all the illustration packages," writes *PC Magazine*.

Software Digest reports that "Designer provides the best overall graphics package. The program offers state-of-the-art features, good performance, and unmatched ease of learning and use in a sophisticated package. Designer can handle virtually any free-form graphics or design task with ease." Designer was awarded a top-of-the-class rating.



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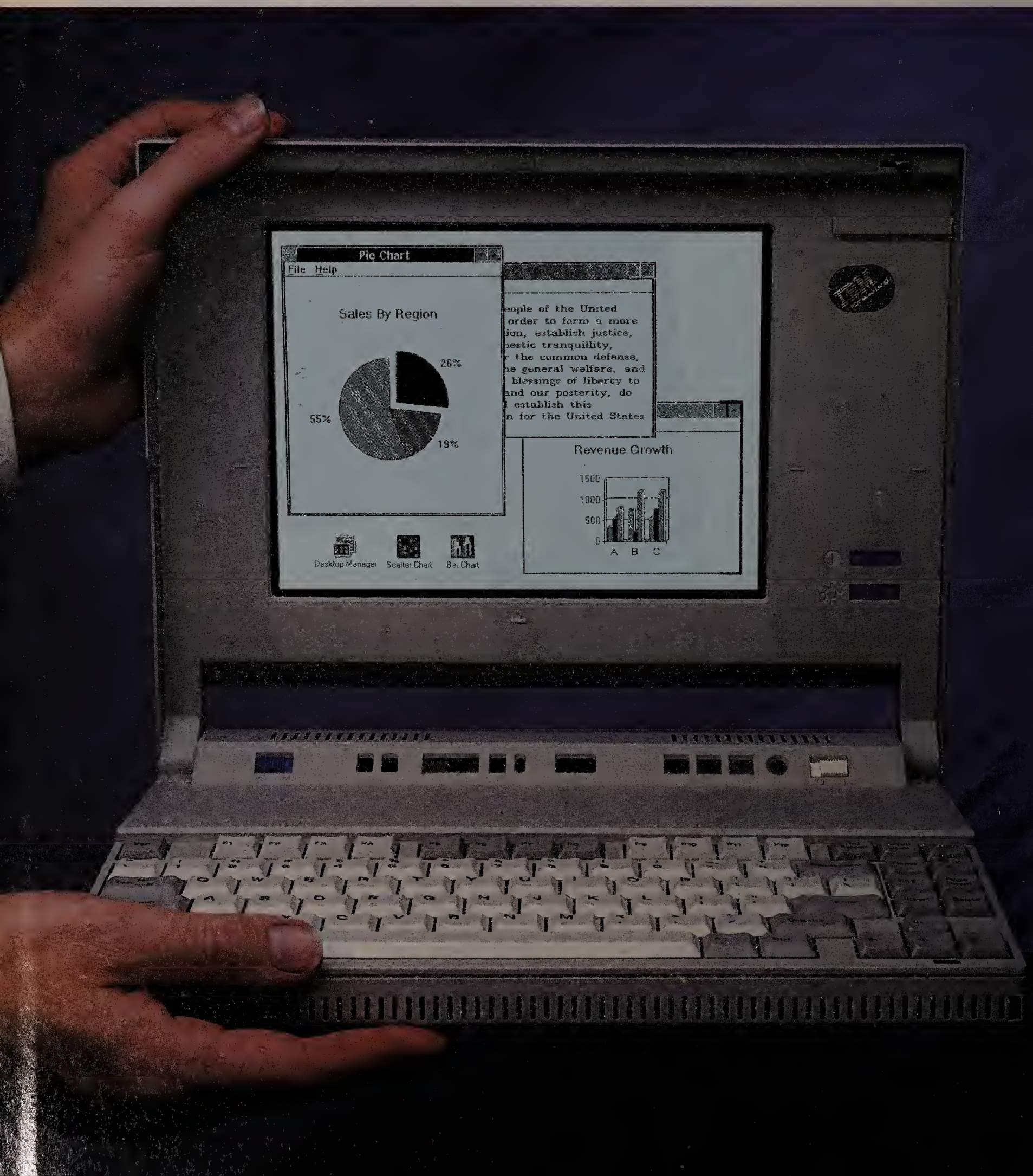

a laptop.
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MICROPROCESSOR	80386SX With Suspend/Resume
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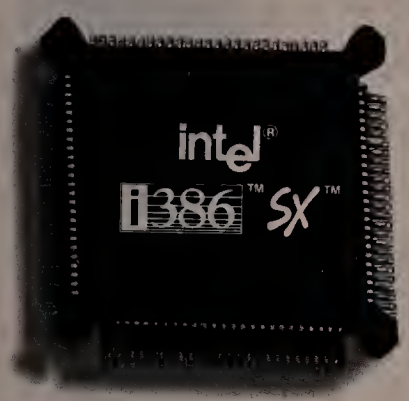
MEMORY	
Standard	2MB
Maximum	18MB
STORAGE	
Standard Diskette Drive	3.5" 1.44MB Diskette Drive
Standard Hard Drive	2.5" 60MB Fixed Disk
PACKAGING	
Dimensions	2.1" (H) x 12.8" (W) x 10.7" (D)
Weight	7.7 Lbs. W/Battery
POWER	
Battery	Up to 3 Hours; W/ Non-Disruptive Exchange; W/ Battery Status Indicator
KEYBOARD	101 Keys (W/Numeric Keypad); 5 Degree Slant; Standard Key Spacing
DISPLAY	LCD/Sidelit; VGA/32 Gray Scale
OPTIONS	Data/Fax Modem; Trackpoint (Mouse/Track Ball); Quick Charger

Introducing A PS/2 Laptop That's Full Of Features. Not Compromises.

Making a computer light enough to take anywhere and small enough to sit on a lap isn't enough. Making it perform like one that sits on a desk is the true challenge. That's why IBM has created a computer that delivers true portability without sacrificing true performance—the Personal System/2® Laptop 40 SX. At just 7.7 pounds it's clearly a lightweight computer. But it certainly doesn't act like one.

Desktop Performance, Without The Desk.



The PS/2® Laptop looks great from the outside. But its true beauty lies inside, where you'll find uncompromised computing power. It has the same 386SX™/20 MHz processor found in best-selling desktop models. A 3.5" 1.44MB disk drive and 2.5" 60MB fixed disk provide fast access to programs and data, and standard 2MB RAM is expandable to 18MB.

Instead of compromising comfort by altering the keyboard, the PS/2 Laptop has a full-size keyboard spaced and arranged the same way as a desktop PS/2's. And instead of squeezing information onto a pint-size screen, it has a sidelit LCD that offers a 10"-diagonal viewing area. It delivers sharp, clear text and graphics with VGA quality in 32 shades of gray. With so much to offer, the PS/2 Laptop succeeds at being small, without being small-minded.

The PS/2 Laptop Is One Laptop Not To Be Taken Lightly.

IBM knows it's not how small you make it—it's how you make it small. The PS/2 Laptop has system status icons that monitor assorted functions and battery life. Extensive power management controls include the ability to change batteries in the middle of an application without exiting and a special feature that suspends power when the screen is closed, then returns to full power when reopened, resuming applications where they were left off without the need to save to the hard drive.

Of course, it comes with an AC adapter, and a 2400 BPS Data Modem/9600 BPS Fax Modem is available, as well as a special mouse that doubles as a trackball when turned over. And the PS/2 Laptop comes with something no laptop should be without—an international warranty* backed by thousands of Authorized Remarketers worldwide, so service and support are never far away.

To find out more, contact your IBM Authorized Remarketer or IBM marketing representative. You'll see why with the new PS/2 Laptop, you don't need a whole lot of room to get a whole lot of computer.

How're you going to do it?

PS/2 it!

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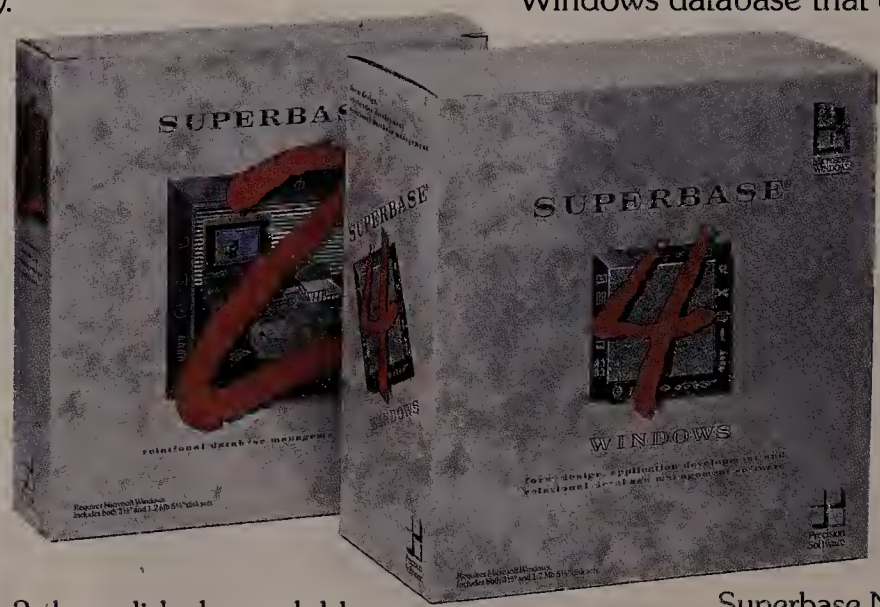
While others struggle to break into Windows, the #1 Windows database just got better.

If you're moving your database operations to Microsoft® Windows™, you need dependability and experience. You should be looking at Superbase®, the world's best-selling Windows database.

Superbase has all the tools you need to create Windows relational database applications that really work. An intuitive and easy-to-use interface. A superior Form Designer. Powerful procedural and non-procedural tools for application development. Full DDE and DLL support. Network connectivity and WYSIWYG functionality. Even non-programmers can build powerful applications quickly and easily.

And now, Superbase SQL Library lets you connect to multiple SQL databases and servers like Microsoft SQL Server, Gupta's SQL Base®, Oracle® Server and others. Concurrently.



Proven Performance

While other companies scramble to produce their first Windows version, Superbase is celebrating its third year as a Windows database technology. Three years of continual refinement have made the new Version 1.3 the solid, dependable and easy to use product that it is today.

Which is why it is the leading Windows DBMS. Why it is used with confidence by major corporations around the world. Why it was selected by Microsoft and AT&T for some of the largest Defense Department and US Government PC contracts ever awarded. And why hundreds of VARS and systems consultants use it as their database platform of choice for Windows application development.

A Complete System

Superbase is a complete family of products designed to meet a broad range of requirements, from executive use with Superbase 2, to MIS application development with Superbase 4. Not only are these products fully upward-compatible, but applications designed with Superbase 4 can run with Superbase 2 as well as with royalty-free Runtime Systems. Version 1.3's Network Extensions offer state-of-the-art concurrency control on networks, while Superbase SQL Library ensures easy integration with SQL database servers.

Find out why Superbase is the only Windows database that can meet *all* of your Windows database needs.

Visit your dealer today or call us for information and a working model demo disk.

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Version 3.0 Compatible Product

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Superbase 2	$345.00
Superbase 4	$695.00
Superbase SQL Library	$495.00
Superbase 4 Developers Edition	$1295.00
Superbase 4 Developers Upgrade (*Runtime*)	$600.00
Superbase Network Extensions	CALL

Superbase is available through all major retail dealers including Egghead Software, Corporate Software, SoftWarehouse and independent dealers and VARs everywhere. All prices are US list.

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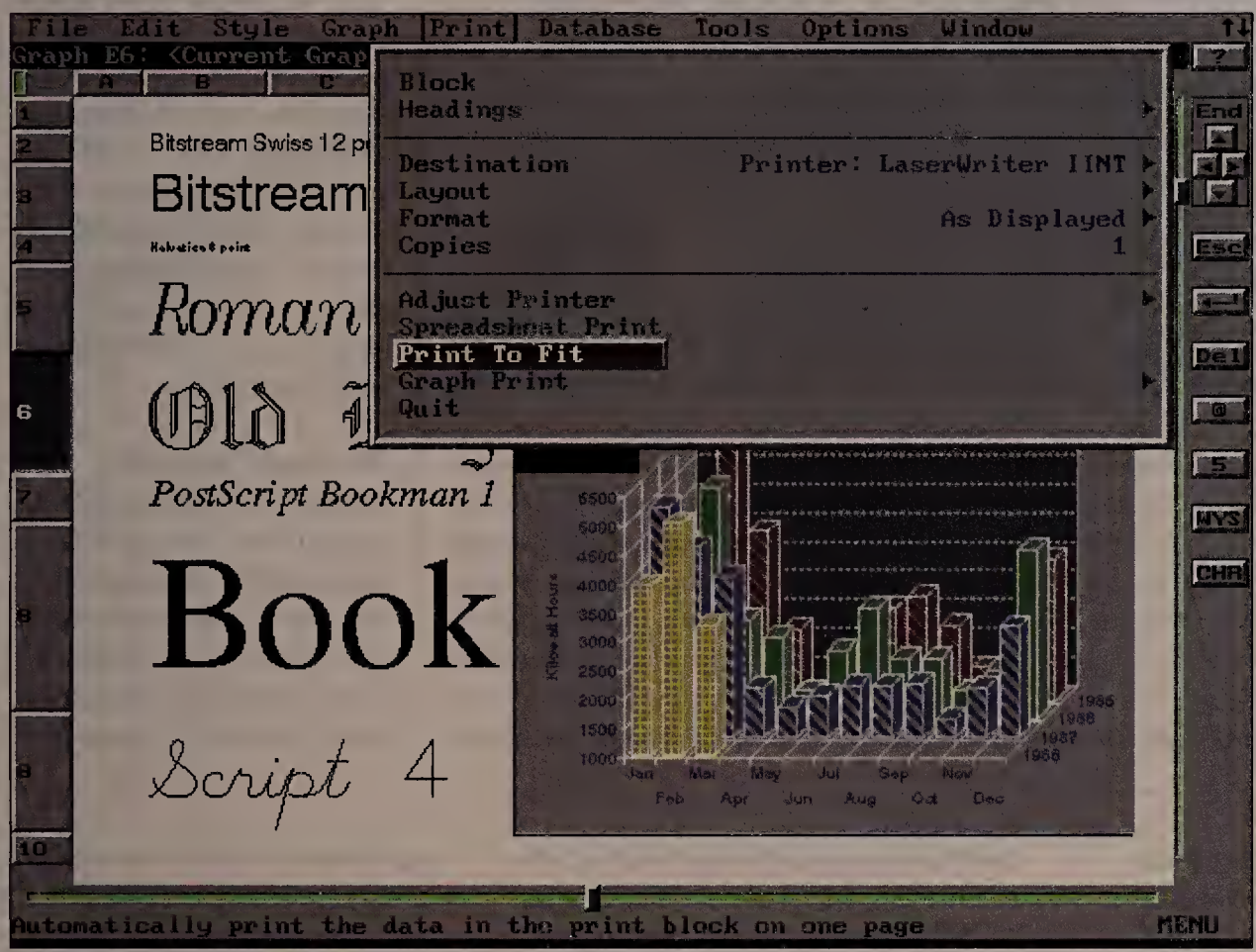
Circle 244 on reader service card

Quattro Pro Adds Pizzazz

Quattro Pro 3.0 offers a snazzy new interface, improved printing, and automated slide shows—plus a host of other business presentation features.



The addition of a WYSIWYG display in Quattro Pro 3.0 enables you to see your fonts and graphics on screen just as they will appear in a printed document or slide.

Richard Scoville

At its debut, Borland International's *Quattro Pro* offered pulldown menus and spreadsheet publishing features that put the original *1-2-3* to shame. Version 2.0 continued that tradition by adding superior graphics capabilities for both data analysis and presentations.

Quattro Pro 3.0 tops them all, providing a new graphical interface and even better presentation features. That means better output for users who require sophisticated presentation capabilities but don't need the advanced analytical features of such hardware-hungry products as *Excel 3.0* and *1-2-3* release 3.1.

A Dazzling New Look

The changes to *Quattro Pro*'s interface are not just cosmetic. Having a WYSIWYG interface means that your worksheet appears on screen just as it will look in print, requiring fewer test printouts to get the page just right.

To cut down on all that scrolling when you move through a big worksheet, *Quattro*'s normal screen area has been enlarged: It displays 23 rows, and an extra half column in width. You can zoom the view from 25 to 200 percent of normal size, checking any fine publishing details before printing. Row height and column width are now easily adjusted with a mouse, so it's easier to tweak the spacing.

With version 3.0, you can also attach live graphs to spreadsheet ranges, checking on trends as you plug in new numbers. *Quattro*'s annotator lets you draw diagrams and import CGM files, so you can spruce up your worksheet with these graphs as well.

Overall, *Quattro*'s new interface is attractive and functional, but it lacks the support for multiple operations that competitors offer. You can't select multiple ranges and then issue a single command, as in *Excel*, nor can you execute multiple commands on a single preselected range, as in *1-2-3* release 2.3 and 3.1.

More Powerful Printing

If you've ever wrestled with big reports, you'd kill for *Quattro Pro*'s Print-to-Fit function. Select a big print range, and you can adjust the whole thing to fit on a single page—and say good-bye to repeated trips to the printer.

For really wide spreadsheets, you can print sideways on a dot matrix printer, just as with Funk Software's venerable *Sideways* utility for *1-2-3*. Take a wide worksheet, block it, issue Print, and *Quattro* will print long rows across the page breaks to create one huge report.

Graphical Gizmos

The new *Quattro* also includes some handy twists on its su-

SNAPSHOT

Quattro Pro 3.0

A snazzy graphical upgrade dresses up *Quattro Pro* and adds frills for great business presentations.

KEY FEATURES

- **WYSIWYG interface with Bitstream screen fonts and zoomable views**
- **Print enhancements, including Print-to-Fit sizing and banner printing**
- **Enhanced graphics annotator**
- **Supports attachment of live graphs to worksheets**
- **Special slide-show effects such as wipes, dissolves, and spirals**
- **Digitized sound effects**

AVAILABILITY

Immediate

PRICING

$495; upgrade from version 2.0 $49.95, from version 1.0 $99.95; PraView Power Pack $49.95 with upgrade

Borland Int'l, Inc.
1800 Green Hills Rd.
Scotts Valley, CA 95067
800/331-0877

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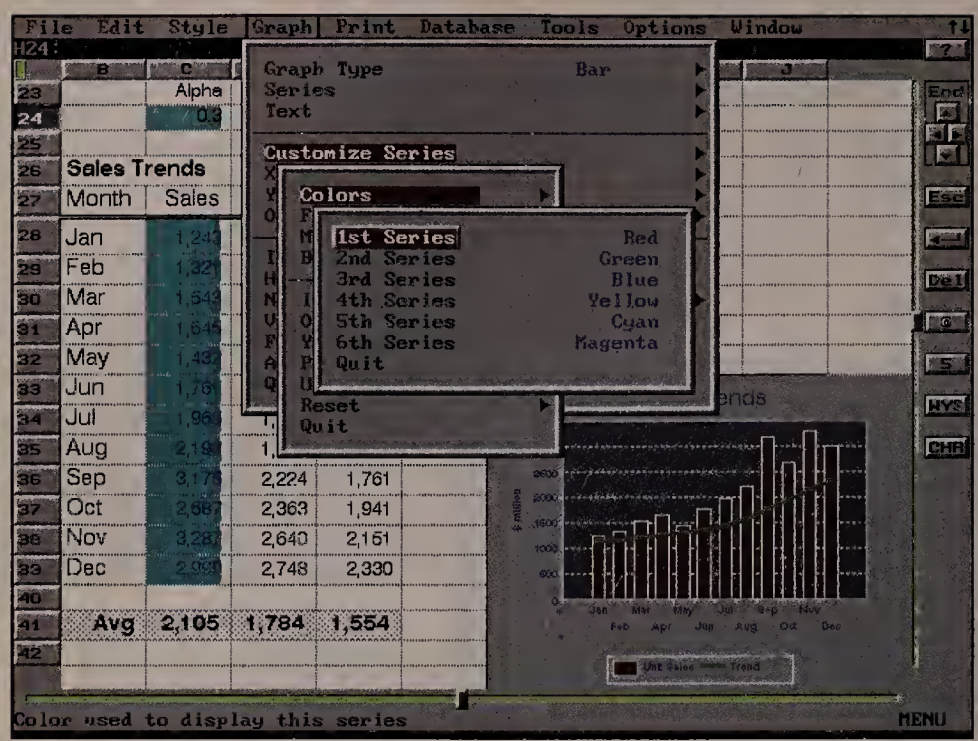

Quattro Pro allows you to insert a spreadsheet graph anywhere on your worksheet and redraws the graph automatically when spreadsheet data is changed.

perb graphics annotator, the built-in drawing program that lets you enhance data graphs or create diagrams. There's now a scalable snap-to grid, which allows you to automatically align such objects as bullets, boxes, or clip art. A new graph-aligning tool precisely aligns the tops, bottoms, or sides of a group of objects. These features are a big help in getting professional-quality layout with a minimum of fuss.

Quattro 2.0 or *1-2-3* users know the frustration of making changes to a graph, only to lose them by neglecting to recreate the graph name. *Quattro 3.0* ends that aggravation with a feature that automatically saves changes to named graphs.

Borland also includes a series of presentation aids in its *ProView Power Pack*, which is available free with version 3.0 (upgraders pay $49.95). *Power Pack* includes Bitstream fonts and 100 color images for spiffing up your business shows.

Power Pack emphasizes training aids and ease of use. For example, a set of templates provides consistent background designs as well as suggested type sizes and spacing for titles and bullets. Additionally, the new macro library includes a helpful feature that applies a template to a set of specified graphs, contributing to uniform design.

Slide Shows Sound Off

Quattro 2.0 pioneered the spreadsheet-cum-presentation graphics program with its annotator, hypertext buttons, and slide shows. Now *3.0*'s *Power Pack* forges ahead with some remarkable new gad-

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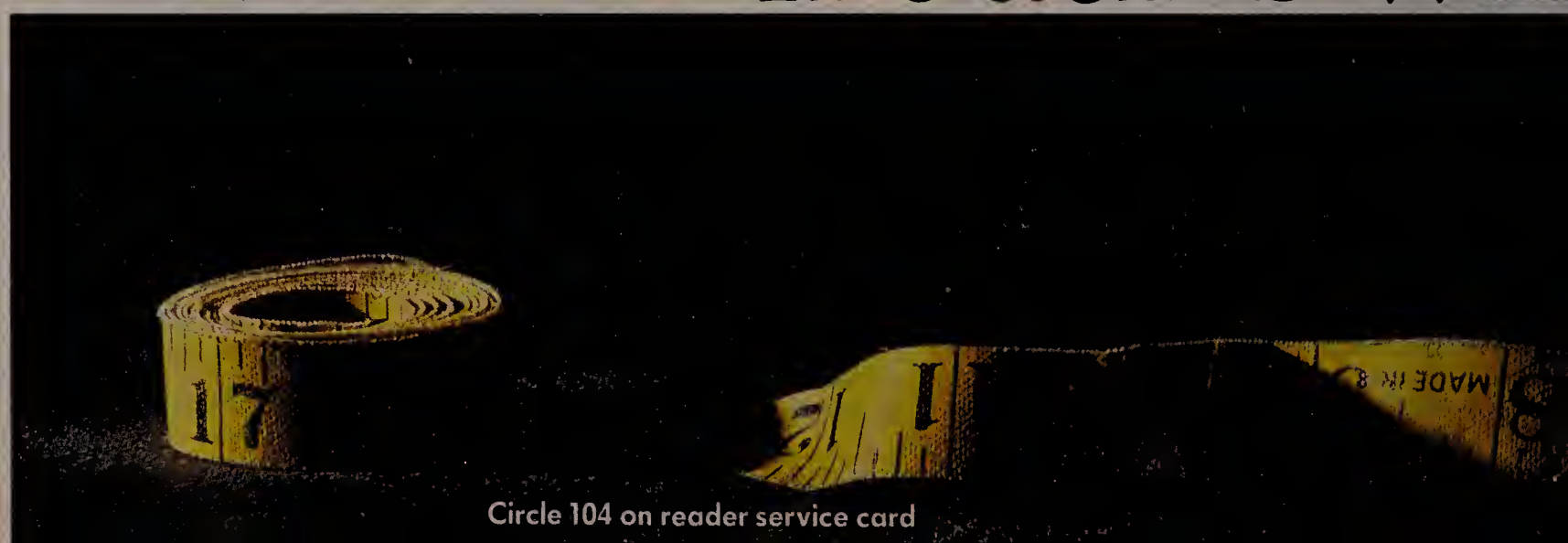
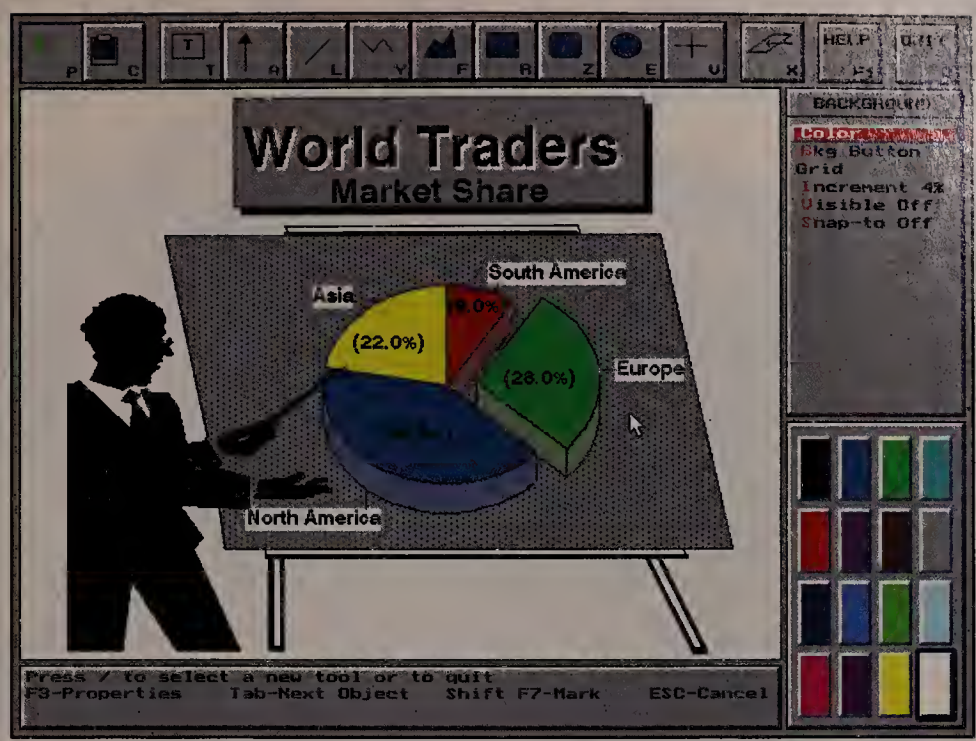


Circle 104 on reader service card

getry for adding special effects to your presentations.

You create a *Quattro 2.0* slide show by setting up a table of graph names and time codes. With *3.0*, you can add another column of codes to get snazzy transition effects like wipes, dissolves, and spirals.

Power Pack also includes digitized sound effects. If you've specified a sound file in your slide-show table, for instance, *Quattro* can herald the next slide with a tinny but easily recognizable drum roll that issues from the PC's speaker. Such features are helpful if you need to whip up an entertaining in-house show.



You can jazz up business data by adding clip art or using exploded pie charts. With Quattro's graphics annotator, you can label sections of a pie and add customized colors.

A Matter for Further Analysis

Quattro Pro 3.0's interface has changed, but its main capabilities remain the same. It's certain to appeal to users who want all the capabilities of *1-2-3* release 2.2, plus superior presentation graphics. However, *Quattro* doesn't offer some advanced tools useful to engineers and financial managers that are currently found in products like *1-2-3 3.1* and *Excel 3.0:* a full-powered solver (for nonlinear equations), true 3-D worksheets, and smart consolidation.

Still, *Quattro Pro 3.0* improves on an already great program while running in only 512K. For users who don't own a 386, it's one of the best choices available, and it's particularly recommended for users who want to show off their data in the best possible light.

Richard Scoville is a contributing editor for PC World.

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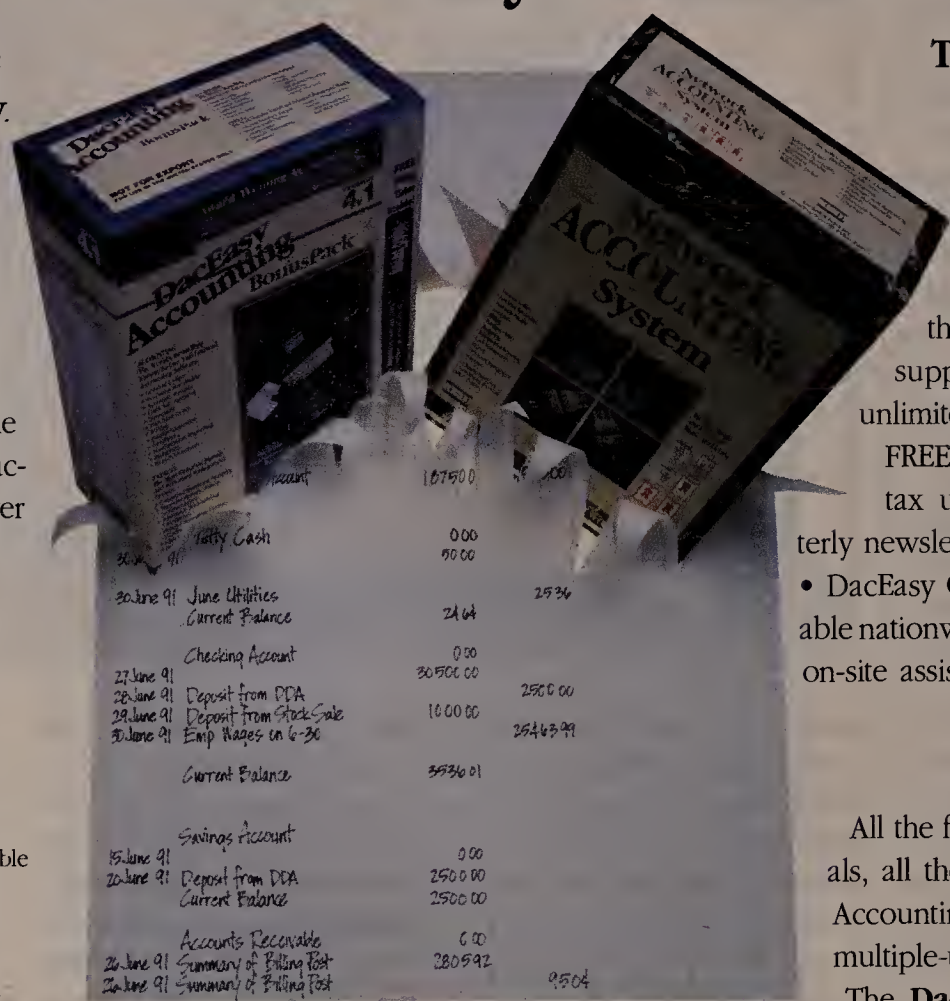

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* Editor's Choice 1985 for Version 1.0, 1987 for Version 2.0.

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Harvard Graphics Scores Again

The leader in PC graphics gets a timely upgrade, with more presentation tricks and improved drawing features.

Harvard Graphics' new drawing tools offer improved color and graphics.

Richard Jantz

With its simple, fill-in-the-blanks approach to chart building and editing, Software Publishing's *Harvard Graphics* remains the most popular of presentation graphics packages. While *Windows*-based products such as Microsoft's *PowerPoint* offer better desktop presentation tools for getting your arms around an entire presentation (such as light-table–like slide sorters), *Harvard Graphics* is still the top choice for DOS users.

Now comes *Harvard Graphics 3.0*, a major upgrade featuring a smoother interface, new templates for creating consistent presentations, and vastly improved drawing tools—all welcome enhancements. The latest version is a must-have upgrade for *Harvard*'s huge following. Veteran users will find that charts contain new shapes, such as 3-D pie slices, cylinders, and pyramids, while streamlined menus and pop-up forms make program navigation easier.

Achieving Global Control

Though some of *PowerPoint*'s very helpful desktop presentation tools—such as an integrated outliner, and a slide sorter for organizing a presentation—are still missing from *Harvard*, new global presentation features are a step in the right direction. You can create a unified, consistent presentation using a master form to control titles, fonts, colors, rules, and backgrounds. You can also save the master form as a permanent template and generate speaker notes to accompany charts.

As in previous versions, *Harvard* will link to an external spreadsheet file, and you can update charts based on this file with a single command. One new plus is that you can view either a *1-2-3* or *Excel* spreadsheet from within *Harvard* and simply highlight the data ranges you want to import into a chart.

Drawing Enhancements

The revamped drawing module now uses icon-based tools and provides the point-and-click simplicity of *Windows* packages. This module lets you perform some impressive new tricks: You can add scanned images (TIFF or PCX files) to charts, "evolve" one object into another (say, gradually change a circle into a square), and "animate" an object during an on-screen presentation to give the illusion of movement, such as an arrow shooting across the screen.

To make your presentation even more presentable, you can take advantage of the program's support for 64 colors (up from 16), blended colors, and Bitstream scalable fonts with multiple fonts per chart.

If you're not yet wedded to *Windows*, *Harvard 3.0* is the program to beat for presentation graphics. However, if you love *Harvard* but are migrating to *Windows*, don't fret: Software Publishing is promising *Harvard for Windows* later this year.

Richard Jantz is a contributing editor for PC World *and author of* Ventura for Windows *(John Wiley & Sons, New York, 1991).*

SNAPSHOT

Harvard Graphics 3.0

An upgrade to longtime favorite *Harvard Graphics* offers enhanced presentation tools and is a must-have for veteran users.

KEY FEATURES

- **New global presentation controls**
- **Broader range of chart styles**
- **Animation effects**
- **Supports Bitstream scalable fonts**
- **Supports 64 colors per chart**

AVAILABILITY

June 1991

PRICING

$595, upgrade from Harvard Graphics 2.3 $125

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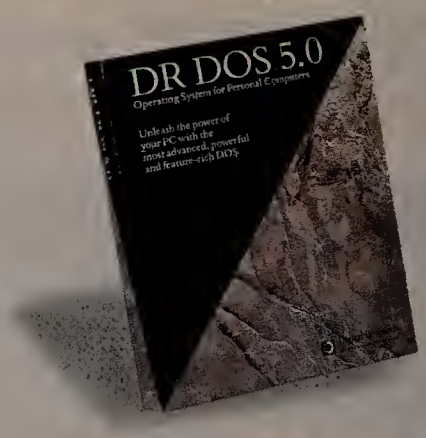

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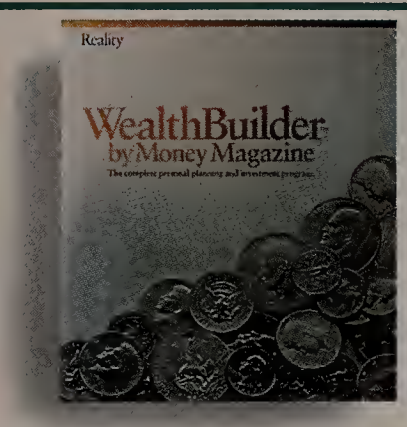

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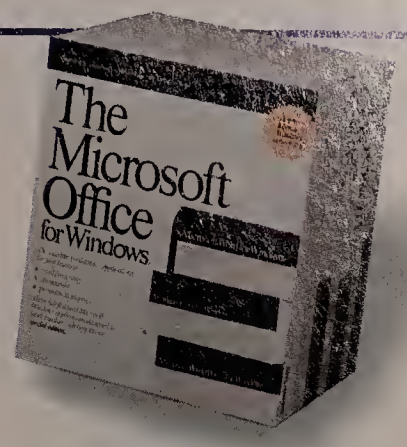

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NBI, Inc. ... NCP
9618 ▣Legacy 1.1 . . . . . 289.

Nolo Press ... NCP
5122 ▣For The Record 2.0 . . . . . 35.
2982 ▣WillMaker 4.0 . . . . . 39.

OCR Systems ... NCP
9879 ▣ReadRight 2.01 . . . . . 309.
9878 ▣ReadRight 3.0 for Windows . . . . . 309.

PC Globe ... NCP
5902 ☐PC Globe 4.0 . . . . . 39.
5900 ☐PC USA 2.0 . . . . . 39.

Personics ... NCP
9288 Laptop Ultravision 1.0 *(3½" only)* . . . . . 49.
4384 ▣Ultravision 2.0 . . . . . 79.
7048 ▣Monarch 1.0 . . . . . 319.

PowerUp ... NCP
7860 ▣Calendar Creator Plus 4.0 . . . . . 45.
7861 ▣Address Book Plus 3.0 . . . . . 49.
7857 ▣Labels Unlimited 3.0 . . . . . 49.
7858 ▣Express Publisher 2.0 . . . . . 89.

Precision Software ... NCP
6600 ▣Superbase 4 for Windows 1.2 . . . . . 429.

Qualitas ... NCP
7539 ☐386MAX 5.1 . . . . . 75.
7967 BlueMAX 5.1 for PS/2 *(3½" only)* . . . . . 85.

Quarterdeck ... NCP
6422 ☐QRAM 1.0 . . . . . 54.
3221 ☐Expanded Memory Mgr. 386 5.1 . . . . . 65.
3220 ☐DESQView 2.3 . . . . . 85.
4586 ☐DESQView 386 2.3 . . . . . 145.

QUE Software ... NCP
4155 ▣RightWriter 4.0 . . . . . 54.

Reality Technologies ... NCP
7891 ▣WealthStarter 1.0 . . . . . 39.
6572 ▣WealthBuilder 1.1 . . . . . 99.

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4396 ▣Grammatik IV 2.0 . . . . . 59.
7483 ▣Grammatik for Windows 2.0 . . . . . 59.

Revolution Software ... NCP
4480 ▣VGA Dimmer 3.0 *(screen saver)* . . . . . 29.

Roykore ... NCP
8162 ▣ABC Flowcharter 1.1 . . . . . 189.

Samna ... NCP
5799 ▣Ami Pro 1.2 . . . . . 309.

Sitka ... NCP
6675 ☐TOPS Network Bundle 3.0 . . . . . 159.
3720 Flashcard 2.1 *(AppleTalk network card)* . 155.

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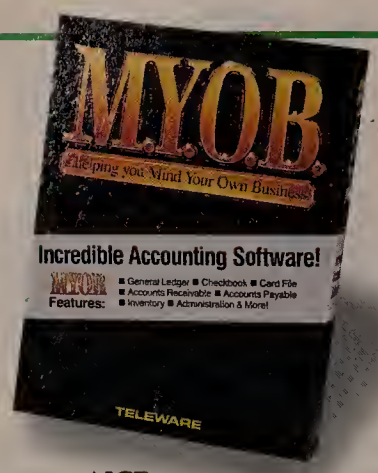

Teleware ... NCP
9847 ▣ *M.Y.O.B. for Windows*–Incredible Accounting Software for Windows. M.Y.O.B. contains full-featured G/L, A/R, A/P, Inventory and Card file. The hottest selling program for the Mac is now available for PC users . **$139.**

Softlogic Solutions ... NCP
3542 ☐Software Carousel 5.0 . . . . . 55.
Software Publishing ... NCP
3496 ☐Professional Write 2.2 . . . . . 169.
9638 ☐Professional Write Plus 1.0 . . . . . 175.
3482 ☐Harvard Graphics 2.3 . . . . . 329.
9490 ▣Harvard GeoGraphics . . . . . 269.
Software Toolworks ... NCP
9859 ▣Word for Word *(Windows version)* . . . . . 47.
Solution Systems ... NCP
7977 ☐Brief 3.1 *(Programmer's Editor)* . . . . . 189.
8915 ☐Sourcerer's Apprentice 1.0 . . . . . 379.
Spinnaker ... NCP
3478 ☐PFS:First Choice 3.1 . . . . . 105.
7604 ▣PLUS for Windows 1.0 . . . . . 289.
Symantec ... NCP
6397 ▣The Norton Backup 1.2 . . . . . 105.
3146 ▣The Norton Utilities 5.0 . . . . . 119.
3425 ☐Q&A 3.0 . . . . . 239.
7999 ▣Norton Anti-Virus 1.0 . . . . . 89.
Systems Compatibility ... NCP
8215 ▣Outside In 1.0 . . . . . 65.
6564 ☐Software Bridge 5.0 . . . . . 79.
Teleware ... NCP
9847 ▣M.Y.O.B. for Windows . . . . . 139.
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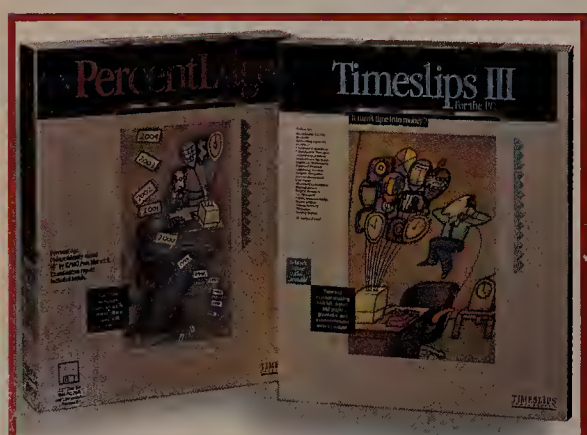
2987 ☐Timeslips III 4.0 . . . . . 195.
6994 ☐PercentEdge 1.0 . . . . . 69.
Timeworks ... NCP
6253 ▣Publish-It! 1.1 . . . . . 139.



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2987 ☐ *Timeslips III 4.0*–Perfect for service professionals (ie. accountants, lawyers, etc.) who need to track & bill their time. . . . **$195.**
6994 ☐ *PercentEdge 1.0*–Calculates mortgages, loans, annuities, present values, & more. . **69.**

T/Maker ... NCP
☐ClickArt *(EPS and Bitmap available)* . . . call
Touchstone Software ... NCP
7420 ▣Check It 3.0 . . . . . 89.
Traveling Software ... NCP
5179 ▣LapLink III 3.0 . . . . . 95.
Ventura Software (Xerox) ... NCP
7796 ▣Ventura Publisher for Windows 3.0 . . . 569.
West Lake Data Corporation ... NCP
7577 ☐PC-FullBak+ 2.0 . . . . . 52.
WordPerfect Corporation ... NCP
7781 ▣LetterPerfect 1.0 . . . . . 129.
3804 ☐WordPerfect 5.1 . . . . . 265.
6685 ▣DrawPerfect 1.1 . . . . . 279.
WordStar International ... NCP
6791 ☐WordStar Prof. 6.0 . . . . . 219.
XTREE ... NCP
6161 ▣XTree Gold 2.0 . . . . . 95.

RECREATIONAL/EDUCATIONAL

Broderbund ... CP
8068 ▣Where in the World is Carmen Sandiego Deluxe Edition . . . . . 52.
5851 ▣SimCity . . . . . 33.
8886 ▣SimEarth . . . . . 45.
Electronic Arts ... NCP
4534 ▣Mavis Beacon Teaches Typing *(CP)* . . . 35.
7865 ☐PGA Golf . . . . . 35.

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7881 ☐Entertainment Pack for Windows 1.0 . . 29.
2858 ☐Flight Simulator 4.0 . . . . . 42.
8270 ▣Aircraft and Scenery Designer 1.0 . . . . 29.
Microsoft Press (Books)
8129 Running Windows *(2nd Edition)* . . . . . 22.
8136 Running Microsoft Excel . . . . . 22.
Penton Overseas ... NCP
▣VocabuLearn/ce Levels I & II (French, Italian, German, Spanish, Russian, Hebrew and Japanese) . . . . . *each* 35.
Sierra ... CP
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9466 ☐Space Quest IV *(VGA)* . . . . . 39.
7972 ☐King's Quest V *(VGA)* . . . . . 45.
SirTech. ... CP
8235 ☐Bane of the Cosmic Forge . . . . . 39.
Software Toolworks ... NCP
4659 ▣Chessmaster 2100 *(CP)* . . . . . 35.
7372 ☐World Atlas . . . . . 42.
Spectrum Holobyte ... NCP
3467 ▣Tetris . . . . . 22.
Stone & Associates ... NCP
5231 ▣Phonics Plus 1.1 . . . . . 22.
7564 ▣Young Math 2.2 . . . . . 22.

Toyogo ... NCP
7676 ▣ *Nemesis Go Master Deluxe 4.7*–Chaos Manor Users Choice Award 1990 (Byte 4/90). Unites the Go playing abilities of Go Master, the corner-opening tutorial Joseki's Genius, & the life & death consultant, Tactical Wizard **$88.**

SubLogic ... NCP
6190 ☐Air Transport Pilot . . . . . 39.
Toyogo ... NCP
7844 ▣Go Junior 4.7 . . . . . 25.
7674 ▣Nemesis Go Master 4.7 . . . . . 41.
7676 ▣Nemesis Go Master Deluxe 4.7 . . . . . 88.
True BASIC, Inc. ... NCP
▣Kemeny/Kurtz Math Series . . . . . *each* 45.

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Warranties listed next to manufacturer.

Acme/SAFE Power Systems ... 2 years
6747 Safe 400S . . . . . 399.
American Power ... 2 years
7108 Smart UPS 400 . . . . . 339.
7105 Smart UPS 600LS . . . . . 469.
6811 360SX *(stand-by power source)* . . . . . 219.
7106 520ES *(stand-by power source)* . . . . . 329.
AST Research ... 5 years
1299 SixPakPlus 384k C/S/P . . . . . 179.
8041 SixPak 286 0k . . . . . 99.
ATI Technologies ... 2 years
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9619 8514/Ultra Graphics Card *(512K) (req. VGA)* 419.
9620 9600etc/e Modem . . . . . 499.
Boca Research ... 5 years
7001 BOCARAM/AT PLUS *(0-8 Meg)* . . . . . 119.
7061 BOCARAM/XT 0K *(0-2 Meg, LIM 4.0)* . . . 99.
6998 I/O Board for AT . . . . . 59.
6999 I/O Board for Microchannel *(S/S/P)* . . . . . 109.
8380 BasicVGA *(256K, 640 x 480)* . . . . . 69.
8381 SuperVGA *(1 Meg, 1024 x 768)* . . . . . 145.
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7400 2 Position Laser Compatible Switch Box. 109.
Brown-Wagh ... 1 year
8578 Creative Labs Sound Blaster . . . . . 159.
Canon ... 1 year
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7897 BubbleJet Ink Cartridge *(BJ-10e)* . . . . . 23.
9037 BJ-300 Printer *(80 column)* . . . . . 549.
9038 BJ-330 Printer *(136 column)* . . . . . 649.
9828 BubbleJet Ink Cartridge *(BJ-300 & BJ-330)* 26.
CH Products ... 1 year
7801 FlightStick w/Falcon . . . . . 49.
8119 FlightStick w/Falcon & GameCard III . . . . 79.
7345 Rollermouse *(Trackball) serial* . 85. *bus* . 99.
CoStar ... lifetime
6091 The Organizer *(mobile storage cart)* . . . . 199.
7453 The Organizer Jr. . . . . 75.
Curtis ... lifetime
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1708 Ruby-Plus SPF-2 Plus . . . . . 65.
7358 Command Center . . . . . 89.
Glass Filter Plus *(specify size)* . . . . . *each* 65.

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It's only natural that you'd find some serious environmental awareness here in the pristine preserve of Marlow, NH (pop. 565). After all, we have some pretty nice environment to be aware of. In fact, 90% of Marlow is undeveloped forest and wetlands. And our headquarters are on the banks of the Ashuelot River, a popular white-water rafting stream. So we're making sure our act is as clean as it can be.

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VGA Wonder+—Offers superior performance, expandable to 1 Mb for 1024 x 768 with 256 colors and 72 Hz support in all modes.
9629 *VGA Wonder+* ..... *with 256K* $239.
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9875 83D87-25 ..... 379.
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9877 83S87-16 *(SX compatible)* ..... 249.

Datadesk ... 3 years
6901 Switchboard ..... 175.

Epson ... 2 years
We are an authorized Epson Service Center.
1906 FX-850 *(80 col., 264 cps, 9 pin)* ..... call
1904 FX-1050 *(136 col., 264 cps, 9 pin)* ..... call
5183 LQ-510 *(80 col., 180 cps, 24 pin)* ..... call
1930 LQ-850 *(80 col., 264 cps, 24 pin)* ..... call
1917 LQ-1050 *(136 col., 264 cps, 24 pin)* ..... call
5184 LX-810 *(80 col., 180 cps, 9 pin)* ..... 185.

Hauppauge Computer ... 1 year
9031 20 MHz 386 Motherboard for PC ..... 995.
9032 20 MHz 386 Motherboard for XT ..... 995.
9870 25 MHz 386 Motherboard for AT ..... 995.
9034 33 MHz 386 Motherboard for AT ..... 1399.

Hayes ... 2 years
2307 Smartmodem 2400 ..... 349.
7391 Ultra 96 Modem ..... 799.
9884 Pocket Edition 2400 ..... 129.

Hewlett-Packard ... 1 year
7976 DeskJet 500 *(with ink cartridge)* ..... 549.
6582 LaserJet IIP *(with toner)* ..... 949.
6754 LaserJet III *(with toner)* ..... 1699.

Hitachi ... 2 years
9492 CM1483M 14" SVGA Monitor *(1024 x 768)* 599.
9491 CM2085M 20" SVGA Monitor *(1280 x 1024)* 1995.

intel ... 5 years
6421 2400B MNP Internal Modem ..... 199.
4696 2400B Internal Modem ..... 149.
5119 2400 Baud External Modem ..... 179.
6420 2400EX MNP Modem ..... 229.
7880 9600EX Modem ..... 549.
2346 Inboard 386/PC with 1 Meg ..... 495.
5336 Above Board Plus 8 2 Meg ..... 549.
5342 Above Board Plus 8 I/O 2 Meg ..... 569.
7782 SatisFAXtion *(fax board)* ..... 399.
8778 SatisFAXtion for Microchannel ..... 449.
8901 Matched Memory 2 Meg *(PS/2)* ..... 159.
8903 Matched Memory 4 Meg *(PS/2)* ..... 299.
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2372 80387-20 *(20 MHz 80386 CPU's)* ..... 399.
4121 80387-25 *(25 MHz 80386 CPU's)* ..... 499.

Kensington Microware ... 1 year
2582 Master Piece Plus ..... $99.
7899 Expert Mouse *serial* .. 119. 7900 *bus* .. 119.

Key tronic ... 3 years
4518 101 Plus Keyboard ..... 99.

Kraft ... 5 years
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5813 Game Card/Thunderstick Bundle ..... 55.
7862 TopTrak *(Laptop Trackball)* ..... 75.

Logitech ... limited lifetime
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7975 ScanMan 256 ..... 319.
8694 MouseMan *(serial)* ..... 69.
9766 MouseMan *(cordless)* ..... 139.

Micron Technology ... 2 years
7595 2 Meg Expansion for HP LaserJet IIP or III ..... 129.
7012 Memory Upgrade PS/2 70 - 2 Meg ..... 149.

Microsoft ... lifetime
7597 Microsoft Mouse ..... 89.
2897 Mouse with Paintbrush ..... 105.
2898 Mouse with Windows 3.0 ..... 149.

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PC-TRAC Trackball
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7271 *Inport* ..... 79. 6330 *PS/2* ..... 79.

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7878 PC Mouse III *(bus or serial)* ..... 89.

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5085 Multisync 3D Monitor ..... 689.

Orchid Technologies ... 4 years
7863 ProDesigner VGA II with 1 Meg ..... 329.

PC Power & Cooling ... 1 year
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7915 Turbo Cool 300 ..... 165.
3200 Silencer 150 *(84% noise reduction)* ..... 115.
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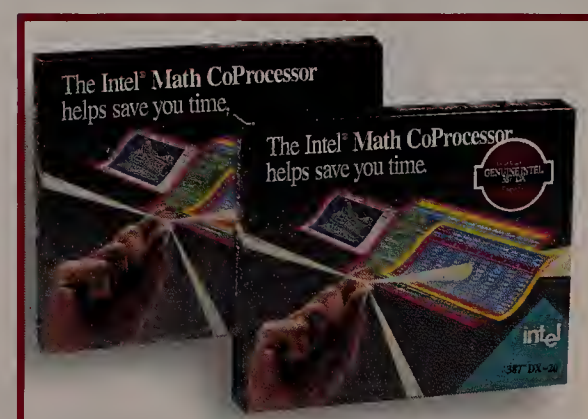
3103 2400 Baud Internal Modem ..... 129.
3102 2400 Baud External Modem ..... 179.
8993 2400 Baud Internal Modem *(V.42 bis)* .. 169.
8994 2400 Baud External Modem *(V.42 bis)* .. 209.
4542 2400 Baud Internal Modem for PS/2 ... 229.
8132 PM2400 Pocket Modem ..... 109.
7934 PM9600SA Modem ..... 489.



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6797 TheComplete Fax Portable ..... 319.
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9893 T2000SX Notebook *(40 Meg)* ..... call
9894 T1200XE Laptop *(40 Meg)* ..... call
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9312 BC450 *(450W Battery Backup)* ..... 269.
7889 BC1200 *(1200W LAN Backup)* ..... 669.
Video 7 ... 7 years
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4931 VRAM II VGA 512k ..... 369.

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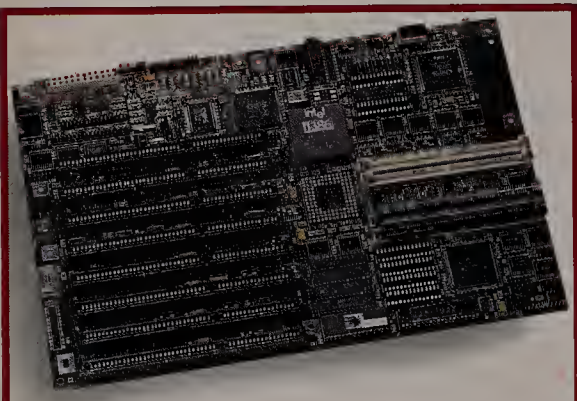
8057 Porta-Drive CD-ROM ..... 649.
8105 Installation Kit for Standard Bus ..... 95.
8106 Installation Kit for Microchannel ..... 249.



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5116 Bernoulli II 44 Meg Internal ..... 829.
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5113 44 Meg Cartridge Tripak *(5¼")* ..... 269.
2500 PC2B Controller ..... 209.
Mountain Computer ... 2 years
2917 40-60 Meg Internal Tape Drive ..... 259.
5500 83-152M Internal Tape Drive ..... 629.
5190 DC2000 Pre-formatted Cartridges... ea. 35.
6153 DC2120 Tape Cartridge *(5 pack)* ..... 149.
Pacific Rim ... 1 year
5010 1.2 Meg External *(for PS/2's)* ..... 215.
6602 1.44 Meg External *(for PC/XT/AT)* ..... 239.
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8304 Hardcard II XL 50 Meg *(9 ms)* ..... 399.
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4951 720k Drive for PC/XT *(3½")* ..... 69.
6951 1.2 Meg Drive for AT *(5¼")* ..... 89.

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2790 5¼" MD2-D 1.2 Mb Diskettes *(Qty. 10)* .. 15.
2792 3½" DS/DD 720k Diskettes *(Qty. 10)* .... 13.
2793 3½" DS/HD 1.44Mb Diskettes *(Qty. 10)* .. 21.

Plus Development ... 2 years
8304 *Hardcard II XL 50 Meg (9 ms)*—Add a super fast, 50 Mb hard drive to any 286/386 system. Anyone can install in just minutes. Takes up only one 16-bit slot ..... $399.

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7894 *BJ-10e BubbleJet Printer*—Light weight, excellent print quality and a great price make this 4.6 lb. printer a winner. Choice of black or white. Optional sheet feeder ..... $349.

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3297 3½" DS/DD 720k Diskettes *(Qty. 10)* .... 12.
3298 3½" DS/HD 1.44Mb Diskettes *(Qty. 10)* .. 19.
6148 3½" DS/DD *(3 Pack)* ..... 29.
6375 3½" DS/HD *(3 Pack)* ..... 49.
8185 QD 2040 Tape Cartridge ..... 19.
3M ... lifetime
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6065 DC 2080 Tape Cartridge ..... 25.
3944 DC 600 Tape Cartridge ..... 29.
5679 DC 6150 Tape Cartridge ..... 29.

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6556 256k DRAM *(100 ns, set of 9)* ..... call
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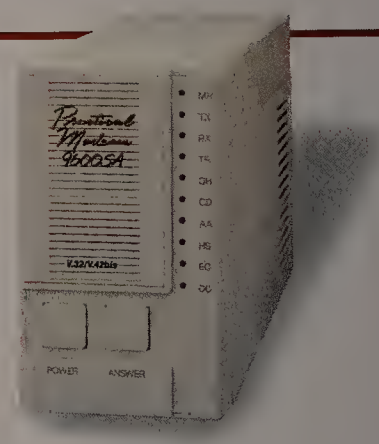

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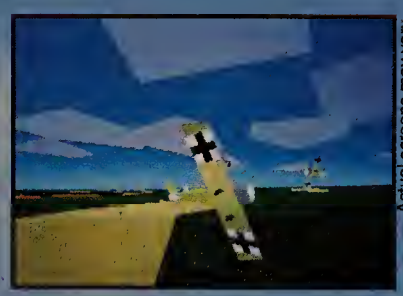
Knights of the Sky™ Shoots Down The Competition

Realistic World War I dogfighting is more than pretty art and canned missions, and MicroProse — the company that *invented* the combat flight simulator — realizes that. *Knights of the Sky* delivers all the sweaty-palm excitement of real World War I dogfighting with great graphics, superior gameplay, authentic aircraft and challenging missions, as well as head-to-head and modem play. Feature for feature, no other W.W. I simulation even comes close.

IBM (VGA)

IBM (EGA)



IBM (VGA)

Actual screens may vary.

IBM (EGA)

- *Knights of the Sky* was developed for *all* IBM-PC/Tandy/compatibles. The graphics and animation are dazzling and smooth with any graphics system, at any machine speed.
- *Knights of the Sky* features realistic, random encounters with enemy and friendly pilots and a sophisticated, authentic campaign option.
- *Knights of the Sky* lets you build a reputation and prestige among your fellow pilots. Become good enough, and *the enemy looks for you.*
- *Knights of the Sky*'s flight equations accurately reflect World War I flying.
- *Knights of the Sky* alone supports head-to-head and modem play, for fast-paced, one-on-one dogfighting duels.

No other game on the market can claim all of the features above. There's only one genuine World War I dogfighting simulation: *Knights of the Sky*.

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For IBM-PC/Tandy/compatibles. For the latest information on release dates and availabilities, call MicroProse Customer Service at 301-771-1151, 9 am to 5 pm EST, weekdays. © 1991 MicroProse Software, Inc., 180 Lakefront Drive, Hunt Valley, MD 21030.

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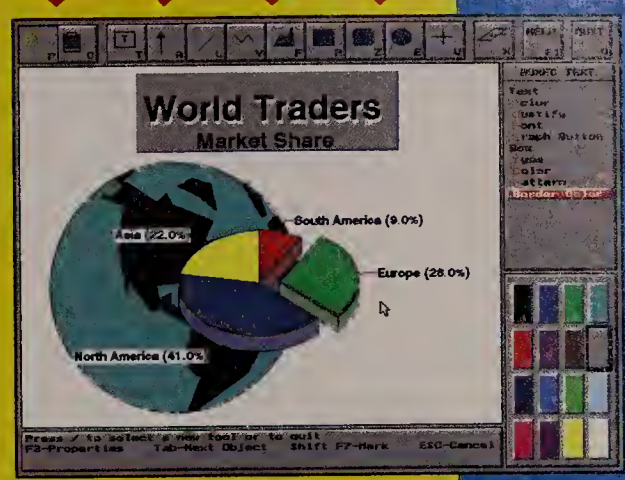

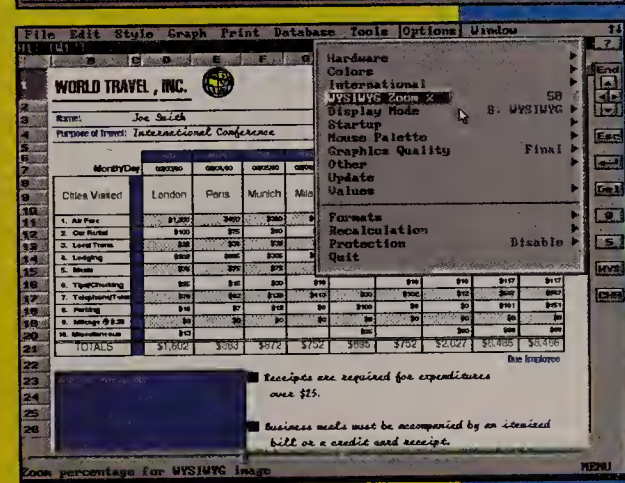

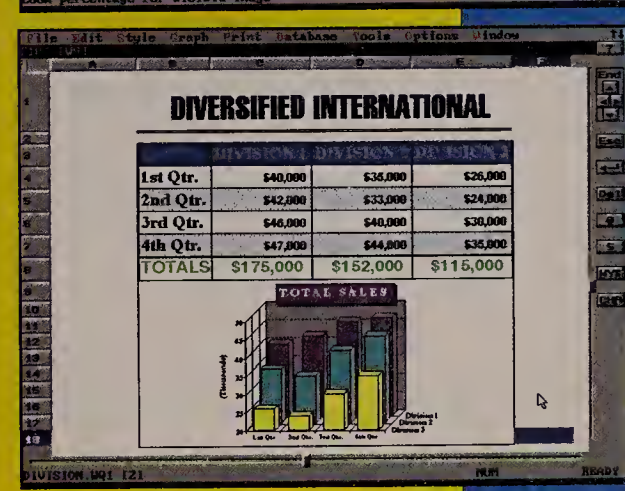

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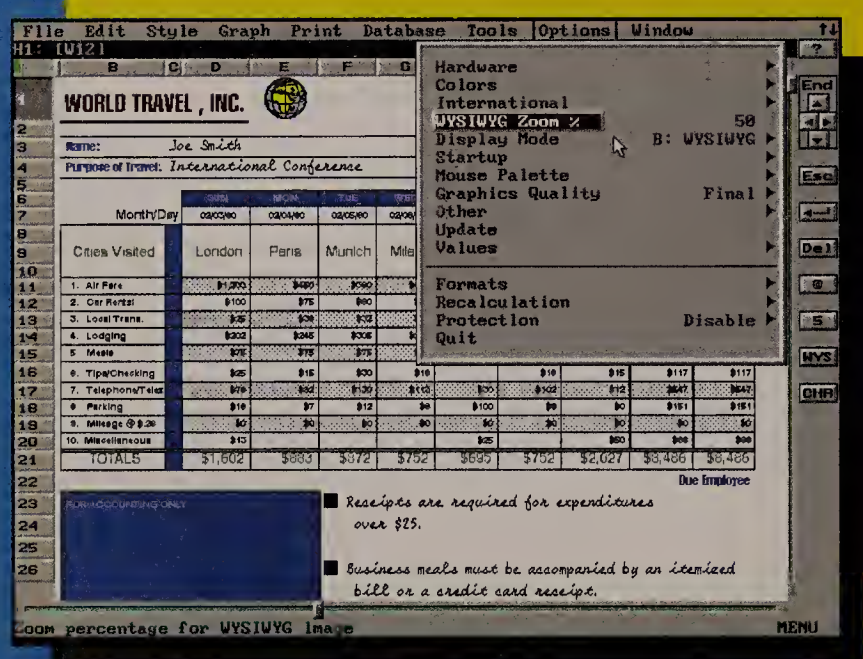

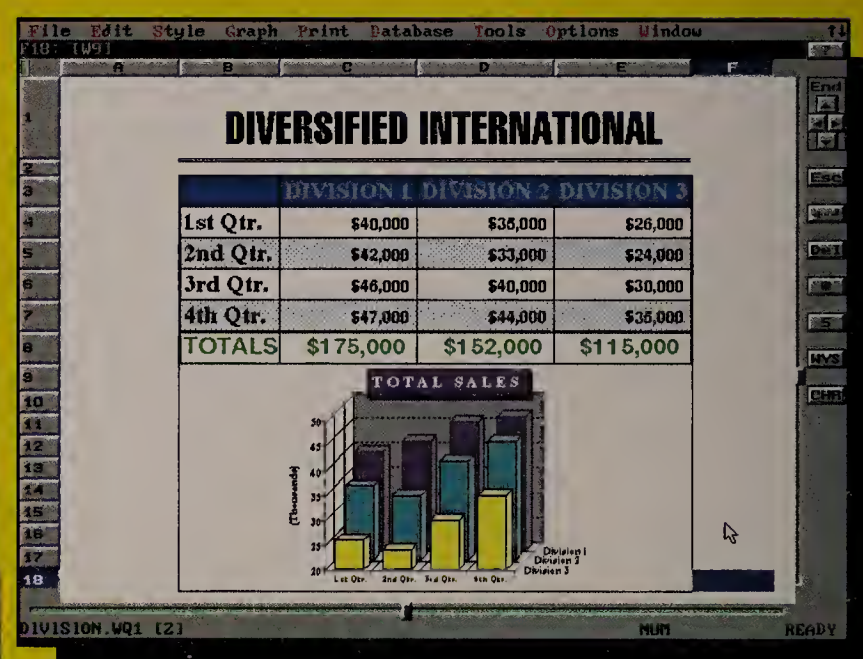

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See Other Side for Details

The Personal LaserJet, Take III

HP's latest laser printer looks like the IIP but packs the wallop of a LaserJet III. And it's only $1595.

The IIIP, HP's newest personal laser, delivers PCL 5 scalable fonts and graphics in a pint-size box.

RICHARD ESKITE

Robert Luhn

The HP LaserJet IIP is the PC's Sancho Panza—and small wonder. For $1295 (around $800 on the street), this tough little printer delivers crisp text and graphics yet fits easily on a desk.

Now Hewlett-Packard has lifted personal printing to another level. The LaserJet IIIP gives you the same compact footprint as the IIP but adds an armada of features—including a faster processor, double the standard RAM, and all the font-scaling goodies of the LaserJet III—for just $300 more.

Sharper, Faster Output

Like its 8-page-per-minute (ppm) big brother, the 4-ppm IIIP sports HP's PCL 5 printer language and the Intellifont type system. You can scale fonts to 999 points, rotate text and graphics, print finer shades of gray, and create special effects such as reverse (white-on-black) type. And it features HP's Resolution Enhancement technology, which changes the size and position of printed dots to create jaggy-free text and curves (though it doesn't affect bitmapped graphics much).

The IIIP also should improve on its predecessor's slugabed reputation. Though it uses the same engine as the IIP, the prerelease IIIP examined here is roughly 30 percent faster, thanks to its 16-MHz processor, 1MB of standard RAM (expandable to 5MB), and a superfast parallel port that accepts 55K of data per second for speedy file downloads. (By comparison, the IIP's port runs at 10K per second.) You should see even greater performance gains when printing vector graphics from programs such as *Harvard Graphics* and *Freelance* that support the IIIP's enhanced HP-GL/2 language.

But the IIIP also shares its sibling's shortcomings. Like the III, it comes with only two scalable type families (CG Times and Univers) in four styles; to add more, you must buy cartridges or software fonts. Paper handling is also minimal: The IIIP's paper tray holds a paltry 70 pages, and a 250-sheet cassette will run you another $195.

Fortunately, buying a IIIP doesn't mean abandoning your HP add-ons. The printer can use IIP or III RAM boards and font cartridges (including PostScript cartridges) and any IIP paper tray or toner cartridge. If your application lacks a IIIP driver, don't sweat; install the program for the IIID, and you can access all of the IIIP's features.

The Personal Choice

The IIIP isn't built for shouldering network work loads or producing complex documents, but its scalable fonts, speed, and sharp output will win the loyalty of many users looking for a faithful desktop companion. Although HP will keep the IIP on the market (and plans to offer a PCL 5 cartridge in the fall), there's really no question—the IIIP is worth the extra bucks.

Robert Luhn is a contributing editor for PC World.

SNAPSHOT

HP LaserJet IIIP

HP's newest personal laser is still small and cheap, but it has the font and graphics panache of the LaserJet III.

KEY FEATURES

- **Same compact footprint as IIP**
- **Resolution Enhancement for sharper, smoother text and curves**
- **PCL 5 with on-the-fly font scaling, text rotation, and special effects**
- **16-MHz processor and fast parallel port**
- **Comes with 1MB of RAM and 8 scalable typefaces**

AVAILABILITY
April 1991

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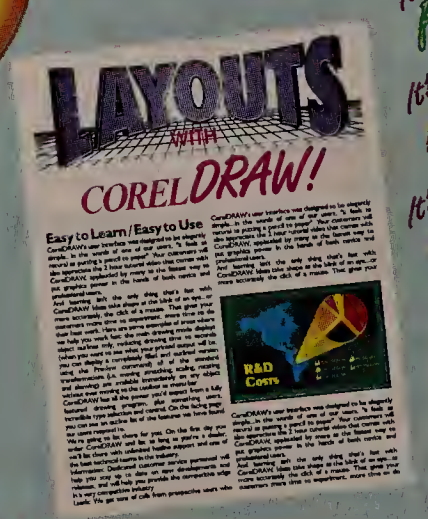

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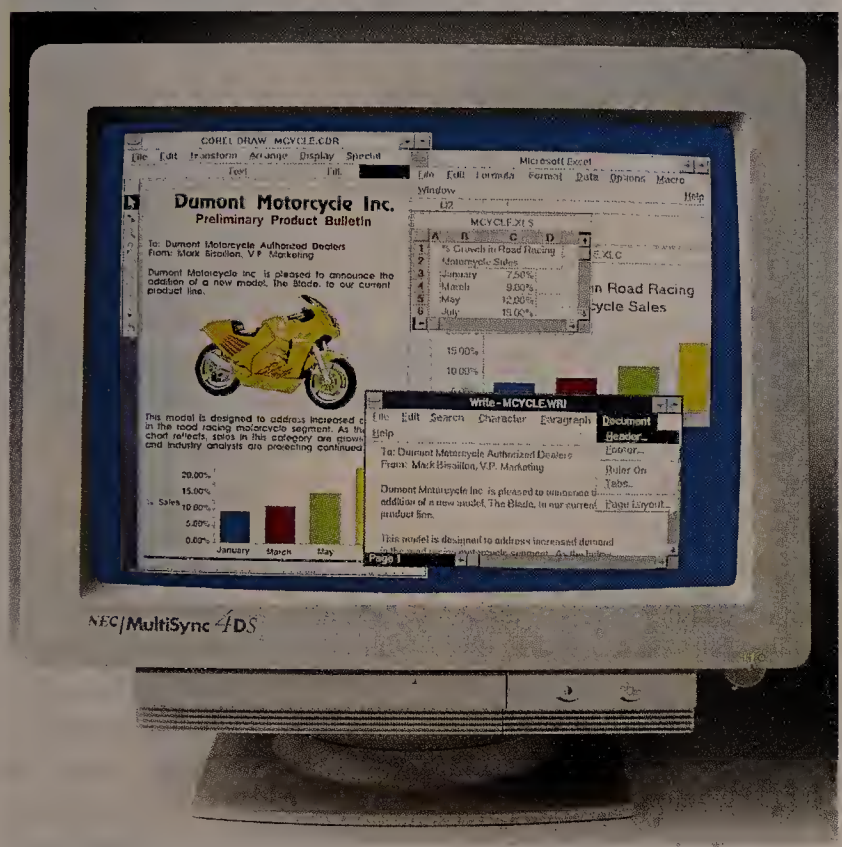
PRODUCT OUTLOOK

Edited by MIKE HOGAN

MultiSync 4Ds, 3Ds

Monitoring Your Health and Safety



The 16-inch MultiSync 4Ds provides the best in emission controls and ergonomic niceties as well as reducing sources of eye fatigue.

Whether monitor ergonomics and emissions are subjects of deep concern to you or only of mild interest, it's impossible to ignore them now that several states are considering adopting Swedish government rules for limiting monitor emissions.

This year the Swedish agency MPR expanded its guidelines to include extremely-low-frequency (ELF) emissions (see *Consumer Watch*, May 1991), a challenge that NEC Technologies meets with the MultiSync 4Ds. This 16-inch monitor not only is one of the first to comply with the newest MPR specifications, but it successfully addresses a slew of ergonomic issues.

The MultiSync 4Ds makes a three-pronged attack on electric and magnetic emissions. A cancellation yoke over the tube limits stray magnetic fields; grounding wires drain off power supply and transformer fields; and additional shielding reduces radio wave emissions. The combination of these three elements reduces very-low-frequency (VLF) and ELF electric and magnetic emissions to levels within the new MPR limits. As a bonus, a coating on the screen dissipates static electricity, eliminating that annoying layer of dust that has probably gathered on your current screen.

But emissions controls are only the start. Front-mounted switches mean you don't have to hug the display to turn it on, or tweak its image from the rear. A .28mm dot pitch and dynamic beam focusing combine to provide sharp focus and clarity. And a noninterlaced 70-Hz refresh rate reduces irritating screen flicker, along with eye fatigue—one issue that the much-ballyhooed Swedish studies do not address.

The rest of the 4Ds feature set is equally strong. Its 16-inch screen is large enough for all but the most demanding users of *Windows*, spreadsheet, or CAD programs. A 1024-by-768-pixel resolution displays images from most high-resolution drivers in all their glory. The combination of tube design and dynamic beam focusing keeps images sharp even in the corners—a must with *Windows*.

As you might expect, the reassurance of having a very-low-emissions monitor comes at a price: $1499. You may not find the investment worthwhile unless you need a large-screen display and plan to spend a few hundred more on a super-VGA card that will do the monitor justice. If price is an object, NEC offers the MultiSync 3DS at a more attractive $1049. However, the older monitor was made to meet earlier Swedish VLF magnetic standards and doesn't satisfy the recent recommendations.

—*Matthew Lake*

IN BRIEF

MultiSync 4Ds, 3Ds
This big multiscan monitor reduces electric and magnetic emissions and combines high resolution with ergonomic features.

NEC Technologies, Inc.
1255 Michael Dr.
Wood Dale, IL
60191-1094
800/366-3632,
708/860-5618 (fax)
Reader service no. 675

INSIDE PRODUCT OUTLOOK

102 **Tandy 1000 RLX** Home PC gets more RAM, more power, more storage.

102 **Finance10** Perform financial calculations from within other programs.

104 **The Complete Font Cartridge Library, PacificPage XL** Get faster PostScript output from your LaserJet, plus scalable fonts.

106 **Relay Gold 5.0 for Windows** *Windows* simplifies PC-to-mainframe communications.

106 **NetWare 386 3.11** Expanded links to Macs and UNIX highlight upgrade.

108 **Lotus Notes 2.0** Beefed-up group communications package lowers price, distribution barriers.

110 **MicroPaq 452** Multifunction board packs a disk controller, multiple ports, and VGA in one slot.

110 **Oracle Card for the PC** Environment gives *Oracle Server* offices easier access to SQL-stored data.

112 **Central Point Backup 7.0** A backup favorite adds *Windows*, versatility.

114 **Panasonic KX-P1124i, IBM Proprinter 24P** New entries—one dazzling, one down-to-earth—liven up dot matrix market.

114 **LANstep** Hayes introduces easy operating system for peer-to-peer LANs.

Tandy 1000 RLX

More Is Better, at Home or at the Office

When Tandy introduced its 1000 RL home PC in August 1990, it said an 8086 processor with 512K of RAM and a monochrome CGA display was enough for folks who were just going to catalog their butterfly collections and keep a few recipes.

But enough is never sufficient, and the upgrades just keep coming. Predictably, Tandy has introduced a better home PC, a lot better home PC, for just a few dollars more.

IN BRIEF

Tandy 1000 RLX
More is as desirable at home as at the office, and Tandy's home PC has been beefed up with a 286 CPU, VGA color, 1MB of RAM, and a 40MB hard drive.
Tandy Corp.
400 Atrium
One Tandy Center
Fort Worth, TX 76102
817/390-3011
Reader service no. 678

The 1000 RLX comes with a 10-MHz 286, 1MB of RAM, a color VGA display, and a 40MB hard drive for $1600 ($1200 in the single-floppy version). By comparison, a CGA color version of the 1000 RL with only 640K of RAM and a 20MB hard drive remains $1360.

Tandy added a 28ms 40MB IDE Smartdrive to the RLX for those who need to handle still more butterfly specs and maybe bring a little work home. DOS 3.3 and other system programs are preinstalled on the disk and loaded in ROM as well; press the On button, and you'll be computing.

Up on the screen is the *DeskMate* character-based graphical environment, with its handy set of DOS and desktop utilities easily accessible from a pulldown scroll bar. You scroll down to the *DeskMate* editor, address book, or draw utilities, or pick custom home application from the information center or home organizer menus.

Walk away, and the 1000 RLX screen will blank after a user-defined period of time. The Smartdrive will doze off 5 minutes later, so the system uses about as much power as a clock radio. Hit a key, and take up exactly where you left off.

Tandy offers an upscale home PC with a 286 CPU, VGA color, a 40MB hard drive, and a big bundle of software.

The 101-key keyboard is sculpted for easy typing, and Tandy throws in a two-button mouse. You get the same 1.44MB floppy and whisper-quiet, fanless operation as with the 1000 RL. Put a $150 2400-bps internal modem in the single 8/16-bit expansion slot, and you can connect to the PC-Link consumer network from the *DeskMate* screen or use the *DeskMate* communications module for regular intercomputer communications. And of course, the 1000 RLX still has the *Good Housekeeping* Seal of Approval. —*Mike Hogan*

Finance10

Financial Calculations at Your Fingertips

Usually when you want to know the future value of an investment, a bond yield, or some other financial equation, you're in the middle of something else—a letter, a spreadsheet, an accounting program.

You can reach for the good old Hewlett-Packard calculator, or you can pop up *Finance10*, a utility that brings the answers to detailed financial calculations within easy reach of finance professionals and home users. You can run *Finance10* either as a standalone application or as a TSR that requires only 8K of RAM.

The program includes a suite of ten ready-to-use modules preloaded with the formulas for calculating bond-to-yield maturity, depreciation, internal rate of return, lease-versus-purchase figures, loan amortization schedules, and present value/future value. It also is helpful in compiling and tracking personal assets and making buy/sell/lease decisions for, say, a car or a house.

All ten modules are selected from the main menu and share the same fill-in-the-blank interface. You choose the function you want, punch in numbers when prompted, and press the <F10> key for a quick answer—no calculator modes to deal with, no formulas to remember.

Finance10 also includes two pop-up calculators. One is a tape calculator for doing simple math. The second is an accountant's calculator with almost twice the number of keys and functions, including some special keys for financial and statistical calculations.

Finance10's $69.95 retail price includes unlimited telephone technical support as well as bundled coupons worth more than $1000 off a variety of other software products, including *XtreePro Gold* and *Who-What-When*. The package requires DOS 3.0 or a later version. —*Roberta Furger*

IN BRIEF

Finance10
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The Complete Font Cartridge Library, PacificPage XL

The Mother of All Font Cartridges

The Complete Font Cartridge Library crams 51 scalable font outlines—roughly 4MB of data—into a single cartridge for HP's LaserJet III and IIID printers.

Pacific Data Products has made its reputation—and a tidy sum of money—by providing the missing pieces in the HP LaserJet picture. Now Pacific Data is solving a few puzzles of its own, introducing an enhanced scalable-font cartridge and a RISC-based accelerator board for faster PostScript processing.

The Complete Font Cartridge Library crams 51 scalable PCL 5 font outlines—roughly 4MB of data—into a single cartridge for HP's LaserJet III and IIID printers. The $399 cartridge combines all the fonts offered in the $299 Pacific Outlines I and II cartridges, leaving the printer's second slot free for PostScript-emulation or another font cartridge.

The font library features Agfa Compugraphic's scalable Intellifonts: 12 font families in four styles, plus ITC Zapf Dingbats, Cooper Black, and Letraset faces. Matching screen fonts for *Windows 3.0* and *Ventura* are available on request from Pacific Data, but installing all of them requires a whopping 5.5MB of hard disk space.

The $499 PacificPage PE cartridge is well known for squeezing low-cost PostScript output from a LaserJet, but no one's ever accused it of being in much of a hurry. Fortunately, the PacificPage XL accelerator board gives the sluggish cartridge a needed boost.

Crunching numbers is a big part of handling PostScript files, and that's what the XL's i960 processor does best. The XL plugs into one of the two memory slots in your LaserJet IIP, III, or IIID and speeds processing of complex PostScript graphics files by an estimated 200 to 700 percent. You can also download Adobe Type 1 fonts to its 2MB of onboard RAM.

For transferring data or handling files in the LaserJet's native PCL mode, you must rely on the printer's built-in M68000 processor. When the printer switches from PostScript to PCL, the XL's 2MB of RAM can be used for storing page data or downloading fonts—just like a normal memory upgrade board.

However, the accelerator board won't work without the cartridge, which is why the XL is available only as a $999 bundle with the PacificPage PE 4.0 or as a $499 upgrade for current PE 4.0 owners. The XL is not compatible with previous versions of the PacificPage cartridge. —*Daniel Tynan*

IN BRIEF

The Complete Font Cartridge Library, PacificPage XL
Pacific Data Products speeds up its sluggish PostScript cartridge and adds a passel of scalable fonts to its LaserJet III offering.
Pacific Data Products
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Systat 5.0, QCStat, Sample

"What If..."

Knowledge about your product and your market is fundamental to business success. If you can't manage the first, plan to be born to rich parents. If you come up short on the second, *Systat* can help. Version 5.0 of this statistical program will help you explore the who, what, how, and why of your business.

Systat 5.0 features a new menu-driven interface with integrated modules, but its most significant improvements are the *QCStat* and *Sample* add-ons that bring quality control and marketing to *Systat 5.0*'s regular statistical suite.

Sample helps you analyze the characteristics of a target market—for instance, detecting industrywide trends and identifying the populations best suited to your products and services, using your existing *Systat 5.0* data files to perform probability tests. *Sample* writes its own files and notations on population selections and sends the results back to *Systat*. Additionally, *Systat* saves information about the testing specifications and commands, so you can keep track of how populations for a given test were selected. You can slice your population in a variety of ways—anything from a basic random sample to highly complex samples that use stratification, clustering, and variable probabilities.

QCStat employs *Systat 5.0* data files for both on- and off-line quality-control analysis. *QCStat* produces control charts based on the sample's distribution, and it designs experiments to test new methods of improving your products or services. In addition to eight types of Shewhart charts, *QCStat* can plot seven other control charts such as boxplot, Pareto, and linear regression.

QCStat's command line interface writes *Systat* and ASCII data files that can be fed into *Systat*'s internal graphics application, Sygraph. Both add-ons require the $895 *Systat 5.0*. QCStat retails for $400, while *Sample* is $110; the upgrade to *Systat 5.0* is $195. —*Cathy Smith*

IN BRIEF

Systat 5.0, QCStat, Sample
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Relay Gold 5.0 for Windows

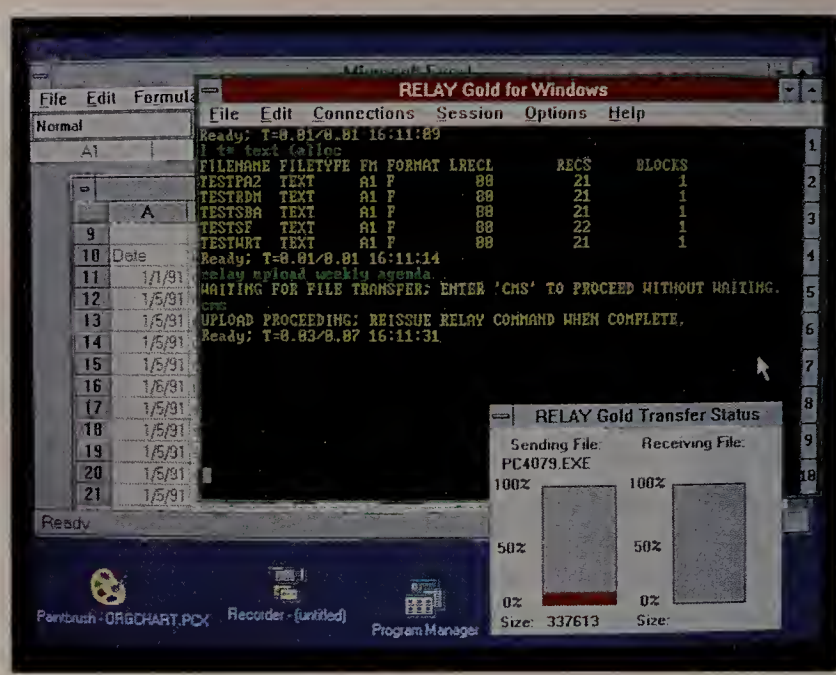
Multiple Windows on All Kinds of Corporate Communications

If you're tired of dealing with the company mainframe on its terms, relax. PC-to-mainframe software maven Microcom has brought the point-and-click simplicity of *Windows* to its *Relay Gold* line.

In addition to providing myriad mainframe idioms—everything from ANSI, Telex, and DEC VT 100/VT 220/VT 52 terminal emulations to those for TeleVideo 910 and IBM 3101, 3270, and 3278—*Relay Gold 5.0 for Windows* handles PC-to-PC communications with aplomb.

Relay Gold 5.0 incorporates all features of the *Windows* environment—from cut-and-paste functions to full DDE support. Pop-up programmable keyboards and sizable windows enable you to juggle up to 15 simultaneous unattended and/or background comm sessions.

Relay Gold can directly control 3270 boards and supports token ring networks, LAN modem sharing, and LAN gateways such as SNA/SDLC and X.25. *Relay Gold* speaks through synchronous modems as well—if you purchase the optional $149 SDLC Dial-Up Module.



Mainframe data transfers become as intuitive as those between PCs, with this high-end communication package.

Microcom doesn't scrimp on PC-to-PC communications features, either. *Relay Gold* offers a convenient phone directory, a learn mode, and a hearty transfer protocol list that includes standards like CompuServe B-Plus, Kermit, and XMODEM. *Relay Gold*'s own proprietary protocol provides on-the-fly data compression and encryption, as well as simultaneous two-way file transfers.

If all you do is talk to other PCs, you may find *Relay Gold 5.0 for Windows'* $399 price hard to swallow. But if you have to parley with the mainframe on a regular basis, *Relay Gold* speaks your lingo. Current *Relay* users can upgrade for $95. —*Art Wilcox*

IN BRIEF

Relay Gold 5.0 for Windows
Microcom combines *Relay*'s vast number of terminal emulations with the ability to run under *Windows*.
Microcom Inc.
Still River Corporate Center
55 Federal Rd.
Danbury, CT 06810
203/798-3800,
203/798-3917 (fax)
Reader service no. 679

NetWare 386 3.11

NetWare Broadens Links, Price Ranges

With version 3.11 of NetWare 386, Novell finally delivers most of the value-added networking facilities it has been promising since the unveiling of its powerhouse network operating system. But all this comes at a price: Novell has raised the cost of the full 250-user product more than 60 percent to a hefty $12,495, and many of the new capabilities are extra-cost add-ons. On the other hand, a new 20-user version gives smaller LANs a major price break of more than $4000 from the $7995 charged for that many nodes before.

The basic 3.11 package includes a mix of goodies—some for enterprise-scale networks, others for those of lesser size. They include improved backup, support for OS/2 1.3 and TCP/IP (a communications protocol for connecting a wide variety of computers), and compatibility with IBM's popular *NetView* network management utility. There's also support for a variety of software standards upon which UNIX developers can build network applications.

The rest of NetWare's new tricks are sold separately as NetWare Loadable Modules. Macintosh support is better than that in NetWare 286: Macs can send output to any printer on the LAN, not just those hooked to the AppleTalk cable. NetWare NFS gives UNIX workstations full LAN access, including shared NetWare server drives and LAN printers. An upgrade to Novell's MHS E-mail-interchange utility allows MHS-compatible E-mail programs to attach up to 64 files and can send a single transmission to multiple recipients on a remote LAN.

Two mainframe-oriented options round out Novell's new offerings. NetWare FTAM links LANs to OSI (European government) and GOSIP (U.S. government) networks and internetworks. LAN WorkPlace for DOS 4.0 hooks DOS or *Windows* users to a variety of IBM, DEC, and UNIX mainframes and minicomputers.

NetWare 386 3.11 costs $3495 per server for 20 users, $6995 for 100, $12,495 for 250; upgrades from earlier versions of NetWare 386 are free. NLMs are variously priced. —*Robert Lauriston*

IN BRIEF

NetWare 386 3.11
Novell delivers not only Macintosh and UNIX connectivity but lots of enterprisewide capabilities.
Novell, Inc.
122 East 1700 South
Provo, UT 84606
800/453-1267,
801/429-7000
Reader service no. 677

To understand the basic principle behind Fastback Plus, tear out this page and destroy it.

LIKE A BOLT FROM THE BLUE,

your hard disk will eventually come crashing down. Manufacturers expect it. They even give hard disks an "MTBF" rating – the Mean Time Between Failures.

Before you lose your valuable data, back it up with Fastback Plus.

BACKUPS IN A FLASH With Fastback Plus, you can do things that DOS Backup never dreamed of. Like back up all your daily file changes in less than a minute. Or blaze through your entire hard disk at three megabytes a minute on 386 machines, or 10 megabytes in four minutes on an AT. It even formats your backup diskettes – automatically.

STRIKING SIMPLICITY Fastback Plus has three user levels – beginner, intermediate and advanced. Simple menus tell you how long your backup will take, and how many diskettes you'll need. And a unique data compression feature cuts the number of diskettes you need in half. You can even automate the entire process with one-touch macros.

DAZZLING SAFETY Only Fastback plus gives you reliable Advanced Error Correction. To illustrate, we punched a hole larger than a .22 calibre slug right through a backup diskette – and retrieved all the data! That's security. And if you need help dodging even bigger bullets, our technical support staff will surprise you with its courtesy and ingenuity. Just call, and you're guaranteed same-day service.

GLOWING REVIEWS *PC Magazine* said it best in giving Fastback Plus its prestigious 1989 Editor's Choice Award: "Fastback Plus has virtually everything a backup program needs: top-speed performance, clear menus, every imaginable option, even a built-in macro program for automating complex tasks. A superb achievement."

A POWERFUL GUARANTEE Use Fastback Plus for 30 days, and if you're not completely satisfied, return it for a full refund. You have nothing to lose. And everything to save.

FREE PYRO For a limited time, get a FREE copy of Pyro!™, our popular screen-saving program just for writing "Pyro" on the Fastback Plus registration card before you return it. That's a $49.95 value – free!

Call now for complete details and the dealer nearest you.

1 - 8 0 0 - 3 8 8 - 0 3 6 2

Fifth Generation Systems, Inc. 10049 N. Reiger Road Baton Rouge, LA 70809 Sales Number: (800) 388-0362 Technical Support: (504) 291-9953

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This product is in no way associated with or has origination in Fisher Scientific or Allied Corporation.

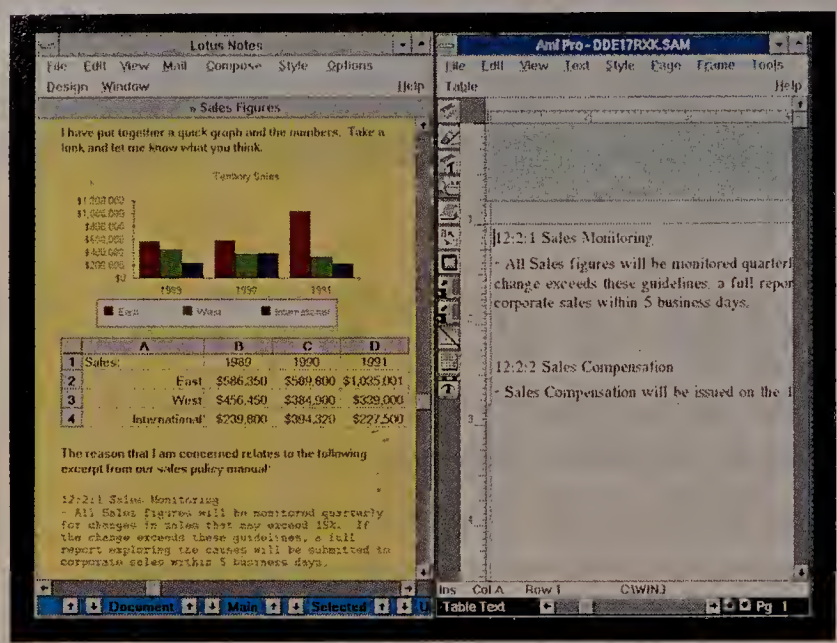
Circle 71 on reader service card

Lotus Notes 2.0

Group Comm Tool Extends Its Reach

In its first year, *Lotus Notes* dramatically remapped the way some critical information flows within dozens of large corporations. Lotus has since beefed up its innovative group communications package and lowered price and distribution barriers—a few inches, anyway—so that smaller firms will have an easier time buying into the network tool.

Easier access to *Notes 2.0* also means a *Windows 3.0* look, more application integration hooks, and a workable system so that laptop users can do serious *Notes* work from a remote location. *Notes 2.0* will automatically route their work once the laptop is connected by modem or network, and remote updates are handled much more quickly.



Thanks to Dynamic Data Exchange, you can easily move data between Notes 2.0 and other Windows 3.0 applications.

Notes gains the ability to exchange data with other *Windows* applications via DDE hot links. It implements the new OLE (Object Linking and Embedding) standard, which lets you automatically invoke *Windows* OLE applications to work on material created within them. (For example, if you've inserted an *Excel 3.0* worksheet within a *Notes* message, you can make changes on the worksheet simply by clicking on it to launch *Excel.*)

Previously, *Notes* images were limited to 64K, but that ceiling has been bumped up to 4GB, and Lotus has added automatic compression/decompression to help you manage those larger bit maps. *Notes 2.0* also provides enhanced electronic-mail features and a wide repertoire of file import/export options. The package runs over NetWare, OS/2 *LAN Manager* and its derivatives', and VINES nets.

Lotus hasn't overlooked security. The public-key encryption technology has been bolstered with physical encryption of data as it is written to disk. You also can encrypt fields within a document and documents within a data base.

Citing high support requirements, Lotus still sells *Notes* direct for $62,500 per 200 users. But the package is also offered now through selected value-added resellers in much smaller quantities, with pricing set by the reseller. —*Eric Bender*

IN BRIEF

Lotus Notes 2.0
Get into group communication more easily, thanks to powerful Windows application hooks, useful remote support, and wider distribution.

Lotus Development Corp.
55 Cambridge Pkwy.
Cambridge, MA 02142
800/343-5414
617/693-3981 (fax)
Reader service no. 682

Volkswriter 2, Volkswriter 4 2.0, Volkswriter 6

Three of a Kind Make for an Easy Draw

It's not easy picking a word processor with just the right degree of sophistication. Choose wrong or outgrow your word processor, and you must write off its cost, perform cumbersome file conversions, and then start all over again at the bottom of the learning curve.

Volkswriter introduces a word processing threesome that makes the climb easier. Your entry-level, intermediate, and high-end choices all have the same user interface and file format, and other differences are smoothed over by a flexible upgrade (and downgrade) policy. This structure also makes it easier for advanced and beginning users to cohabit peacefully in the same work environment.

The centerpiece of the troika is version 2.0 of the long-running *Volkswriter 4*. New features include a graphics page preview, improved proportional font support, macros, and automatic recognition of file formats during document conversion. Previously, style and synonym checkers cost extra, but now *Grammatik IV* and a 310,000-word thesaurus are built into the $249 product.

A scaled-down version—the $149 *Volkswriter 2*—is aimed at the home market and the casual business user. It has the same interface and basic feature set as its big brother but lacks the style checker, thesaurus, and page preview.

You'll have to wait awhile for the third leg of the triad: Volkswriter is recasting *Total Word*, its high-end word processor, into *Volkswriter 6*. Due in the third quarter, this $449 advanced word processor will add personal publishing features to *Volkswriter 4*'s basic feature mix, including an integrated outliner.

Volkswriter lets you move up or down the product line. Upgrading from *Volkswriter 2* to *4* costs $79 and from *4* to *6* $149; moving from *6* down to *4* costs $125 and from *4* to *2* $75. Upgrades from *Total Word* will be $50. —*Eric Brown*

IN BRIEF

Volkswriter 2, Volkswriter 4 2.0, Volkswriter 6
Volkswriter's common file format and interface for advanced, medium, and low-end word processors make it easy to trade up or down.

Volkswriter, Inc.
One Lower Ragsdale Dr., Bldg. 2 #100
Monterey, CA 93940
408/648-3000,
408/648-3016 (fax)
Reader service no. 693

Now that you get the basics, here's why you should get the most popular backup software available.

LIKE A BOLT FROM THE BLUE,

your hard disk will eventually come crashing down. Manufacturers expect it. They even give hard disks an "MTBF" rating – the Mean Time Between Failures.

Before you lose your valuable data, back it up with Fastback Plus.

BACKUPS IN A FLASH With Fastback Plus, you can do things that DOS Backup never dreamed of. Like back up all your daily file changes in less than a minute. Or blaze through your entire hard disk at three megabytes a minute on 386 machines, or 10 megabytes in four minutes on an AT. It even formats your backup diskettes – automatically.

STRIKING SIMPLICITY Fastback Plus has three user levels – beginner, intermediate and advanced. Simple menus tell you how long your backup will take, and how many diskettes you'll need. And a unique data compression feature cuts the number of diskettes you need in half. You can even automate the entire process with one-touch macros.

DAZZLING SAFETY Only Fastback plus gives you reliable Advanced Error Correction. To illustrate, we punched a hole larger than a .22 calibre slug right through a backup diskette – and retrieved all the data! That's security. And if you need help dodging even bigger bullets, our technical support staff will surprise you with its courtesy and ingenuity. Just call, and you're guaranteed same-day service.

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Circle 71 on reader service card

MicroPaq 452

One-Slot Shopping for VGA and More

With the proliferation of printers, scanners, internal fax modems, and networks, your PC stands a chance of becoming as overpopulated as a rabbit warren in springtime.

The MicroPaq 452 multifunction board solves PC overpopulation problems by giving you a disk controller, ports aplenty, and a graphics adapter upgrade that leaves your old VGA in the dust.

The MicroPaq 452 incorporates a new graphics chip from Edsun Laboratories with continuous edge graphics (CEG), an antialiasing technology that makes images and text on a standard VGA or multiscan monitor look almost three times sharper. With its vast palette of 742,000 colors, images and gradual fills have near-photographic quality. The video section of the board is fully compatible with VGA, super VGA (800 by 600 resolution with 16 colors), and nonstandard resolutions of 960 by 720 pixels with 16 colors, and 1024 by 768 with 16 colors.

In addition to driving your display, the MicroPaq provides more ports than most people need—analog and digital monitor outputs, VGA and EGA connectors, two serial ports, and one parallel port. If you have no more than one hard disk and two floppies, the board can handle all your disk controller needs as well. Operating at bus speeds up to 12.5 MHz and equipped with a full 1MB of video memory, the XT-height board is a neat solution to a crowded PC shell.

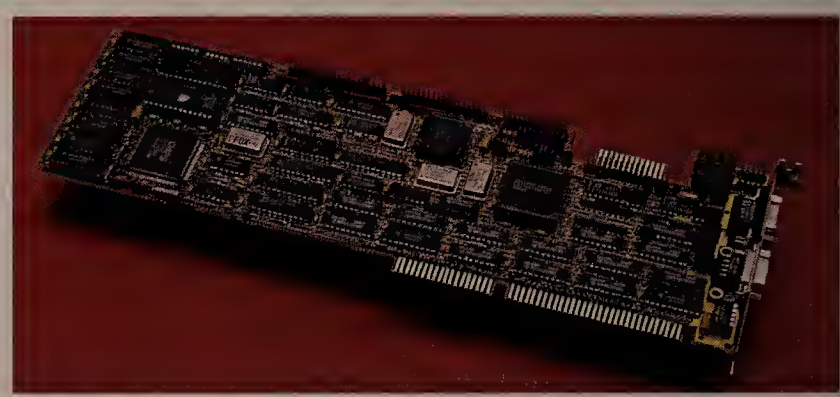
However, not everything is rosy in multifunction land. If any of the board's functions are duplicated on your motherboard or another add-in, you'll either have to fiddle with DIP switches or, much worse, try to slip sleeves on the board's jumpers. This is not a task for the fainthearted.

If you don't need all the board's functions, you might consider the company's upcoming MicroVGA card, which provides only the video offerings of the MicroPaq. Furthermore, the allure of CEG's beautiful images hides the current lack of a full complement of drivers. Before buying, you should check whether your applications are supported.

Nonetheless, for the task at hand, this $725 board, which comes with a five-year limited warranty, provides a lot in a small space, saving your expansion slots for *real* expansion. —*Matthew Lake*

IN BRIEF

MicroPaq 452
This VGA-compatible board provides a disk controller, serial and parallel ports, and impressive continuous edge graphics and takes up only a single expansion slot.
Monolithic Systems Corp.
7050 Tucson Way
Englewood, CO 80112
303/790-7400,
303/790-7118 (fax)
Reader service no. 685



The MicroPaq 452 saves I/O slots by combining a hard and floppy disk controller, ports aplenty, and a continuous edge graphics (CEG) VGA adapter on a single board.

Oracle Card for Windows

SQL Meets Hypertext Under Windows

If SQL ever becomes a standard in the PC world, it will be by virtue of programs that let people avoid it. Only easy-to-use front ends, for defining SQL tables as well as entering and querying data, can offer the advantages of client-server data handling without the headaches of yet another obscure language.

Enter *Oracle Card for Windows*, a graphic, hypertextlike front end that gives *Windows 3.0* users easier access to *Oracle Server* on OS/2-based servers and large-system data bases. The *Oracle Card* environment lets you graphically create data base applications by designing stacks of cards that interact with each other and your SQL-stored data.

Oracle Card won't relieve your company completely of the need for a SQL expert—someone still has to set up the server and each user account. But the average user can define and alter tables through *Oracle Card* without extensive knowledge of the underlying server, as well as give other work-group members access to those tables.

Like most hypertext environments, *Oracle Card* lets you paint or paste graphics into your cards, which can be turned into buttons so that clicking a picture or a portion of a picture will set a process in motion. The graphic images you use in your interface, along with others, can be stored in a data base. You can query through a menu-driven module or—if you prefer—directly with SQL SELECT commands.

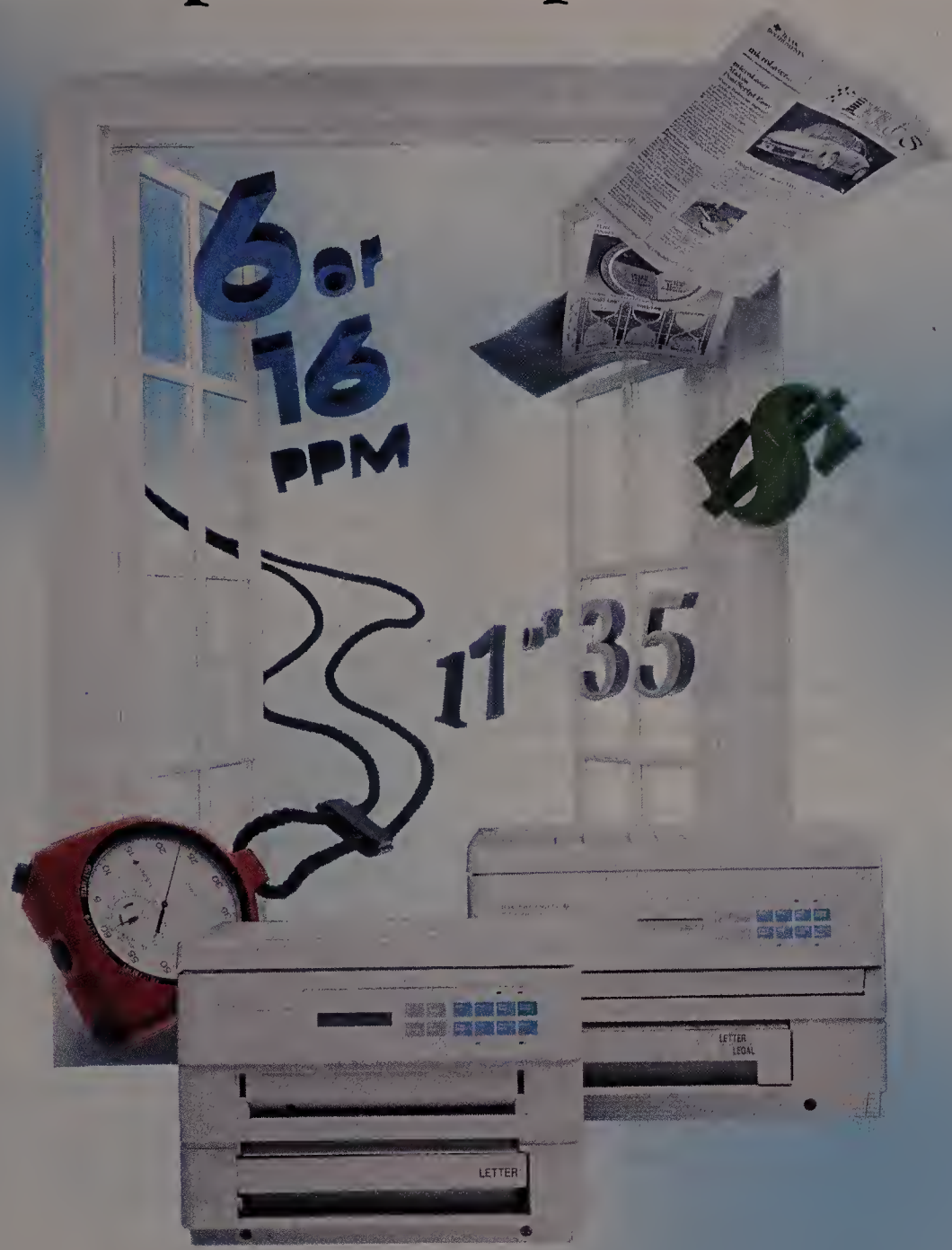
Oracle Card's use is limited to offices that have standardized on *Oracle Server*. When we last compared OS/2-based SQL servers (October 1990), we found *Oracle Server* to be unusually difficult to set up and most appropriate for offices where at least part of the data is on mainframes or minis.

Oracle Card for Windows requires a 286 system, *Windows 3.0*, and a whopping 3MB of RAM. Unavailable at your local computer store, it will be sold only through VARs, specialized network resellers, and directly from Oracle for $299. No run-time version is available. —*Lincoln Spector*

IN BRIEF

Oracle Card for Windows
This hypertext program gives you easy access to Oracle SQL data bases.
Oracle Corp.
500 Oracle Pkwy. #20D
Redwood Shores, CA
94065
800/672-2531
Reader service no. 684

TI microLaser™ printers open new windows.



With powerful fonts and graphics, ease of use and economy.

By now you've heard how fast and easy Microsoft® Windows™ makes it to tap all that PC power you've got on your desk.

Well now there's an affordable, easy way to put that power on paper — microLaser from Texas Instruments.

Right out of the box, microLaser comes with what you need to print the razzle-dazzle pages of text and graphics you've dreamed of creating.

Just plug it in and go.

That's because microLaser PS models come with the Adobe® PostScript® language and the memory it takes to use it. Plus you get your choice of either 17 or 35 scalable fonts, starting at just $1,999.*

When it comes to print speed, microLaser zips along at 6 ppm. If you need a shared printer solution, turn to its cousin, microLaser XL. This workhorse gallops at a formidable 16 ppm.

If all that isn't enough, just look at what else you get with microLaser. It's the smallest printer in its class. It handles more paper and envelopes in more ways. And it supports more than 4,000 software packages, including your Windows applications.

So when you add it all up, you'll understand why the power of your ideas needs the power, convenience and economy of microLaser. Let microLaser open new windows for you.

MacUser ★★★★½

For the name of the nearest dealer, call

1-800-527-3500.

The microLaser PS17 has earned the 1990 *PC World* Best Buy award; microLaser PS35 has earned the 1990 *InfoWorld* Excellent Value award and 4½ mice from *MacUser*, October 1990.

TEXAS INSTRUMENTS

*TI suggested retail price. (Dealers' prices may vary.) microLaser is a trademark of Texas Instruments Incorporated. Adobe, PostScript and the PostScript Logo are registered trademarks of Adobe Systems, Inc. Microsoft is a registered trademark and Windows is a trademark of Microsoft Corporation. ©1991 TI 71816

Circle 296 on reader service card

Panasonic KX-P1124i, IBM Proprinter 24P

Dot's All, Folks

The age of the low-cost laser may be upon us, but dot matrix printers can still make an impact. Industry giants Panasonic and IBM have both rolled out sub-$500 24-pin units aimed at an increasingly competitive personal printer market; the differences between the narrow carriage offerings are striking.

Panasonic's $499.95 KX-P1124i is the next step in the evolution of its top-selling KX-P1124, adding speed, enhanced font and paper capabilities, and an easy-to-use control panel. Feature for feature, IBM's $499 Proprinter 24P can't match it, but its respectable speed and font options should satisfy most true Blue users who are tired of sharing the work-group laser.

The KX-P1124i comes with 11 typefaces—3 draft, 7 letter quality, and 1 super letter quality (SLQ)—in sizes from 5 characters per inch (cpi) to 20 cpi, plus proportional spacing. The SLQ font produces text of near-laserlike quality, but at a loss of print speed. The printer hits a top speed of 300 characters per second (cps) at 15 cpi, hums along nicely at 240 cps in 12-cpi draft and 80 cps in letter quality, and downshifts to 40 cps for SLQ text. Graphics print at a full 360 by 360 dots per inch (dpi).

IBM's 24P offers seven fonts (six letter quality) at sizes ranging from 10 to 24 cpi, plus proportional spacing. Print speeds top out at 192 cps in 12-cpi draft and 64 cps in letter-quality mode, comparable to most 24-pin printers in this price range. Graphics print at 180 by 360 dpi.

The Panasonic's paper handling is top-notch. The unit accepts continuous-form paper, single cut sheets, and envelopes; comes with an adjustable push/pull tractor; and prints four-part forms.

IBM's 24P comes with an unexpandable 32K print buffer and a parallel port and handles three-part forms, envelopes, continuous sheets, and single cut sheets. An automatic cut-sheet feeder costs $199; a pull tractor is $69.

The Panasonic's 12K print buffer expands to 44K via a $60 upgrade. A parallel port is standard (serial optional), and emulations include Epson LQ-850 and IBM Proprinter X24E. —*Daniel Tynan*

IN BRIEF

Panasonic KX-P1124i
The best-selling KX-P1124 gets an upgrade with faster printing, more fonts, and better paper handling.
Panasonic Communications & Systems Co.
2 Panasonic Way
Secaucus, NJ 07094
800/742-8086,
201/348-9090
Reader service no. 680

IBM Proprinter 24P
Big Blue's latest 24-pin printer gives you all the basics for under $500.
IBM Information Products Co.
740 New Circle Rd.
Lexington, KY 40511
800/426-2468
Reader service no. 681

LANstep

Hayes Steps Into the LAN Market

Longtime modem standard-bearer Hayes Microcomputer is venturing into a new form of connectivity with a network operating system designed to be easy to use for first-time LAN buyers and small work groups.

LANstep is a peer-to-peer network that makes life easier for LAN members, starting with a symbol-based interface that provides access to network resources. Users can customize this screen to create symbols representing frequently used applications and activities and call them from within LANstep.

The LANstep workstation software permits sharing of directories, applications, and up to three printers. Each printer has its own spool, and users can cancel and monitor their own print jobs. Network users get a list of available printers and of shared applications and directories for which they have access rights.

The electronic-mail facility offers most of the features you would expect, such as mail forwarding, distribution lists, registered mail, copies, blind copies, attachments, and text editing. Hayes has a mail gateway for sending messages to remote LANstep networks via modem or direct asynchronous connection.

LANstep runs on any NETBIOS network, but to ease installation it comes preconfigured for specified ethernet, token ring, and ArcNet network interface cards and common packages such as *Windows 3.0*, *Word*, *1-2-3*, *dBASE*, and Hayes's own *Smartcom Executive*. Just pick the cards and applications you want to use from a menu, or select 'Other' to install a network driver or application that doesn't appear on the list.

While LANstep's operation is virtually administration-free, someone must periodically create new user IDs and assign printer, directory, file, and application access rights—assigning passwords to permit modify, read-only, or no-permission access. Tools for this part-time administrator include a log of network users, and a display of statistics with the size of shared network disks, their percentage of free space, and the number of unusable blocks.

LANstep doesn't require a dedicated server, but you do need to run the server software on one machine; it looks like a client-server network to users because they can share resources without having to know where they are housed. AT-class or better workstations can run under LANstep and gain full access rights to the network; lesser PCs can run under DOS and share only printers. LANstep system software needs 28K of conventional memory and 1.5MB of extended memory on the "server," 28K of conventional memory and 1MB of extended on every LANstep node, and 122K on DOS workstations (only 9K of which needs to be conventional memory).

LANstep costs $595 for the first five users and $395 for each additional five users; the LANstep Mail Gateway is $395. —*Cheryl Goldberg*

IN BRIEF

LANstep
A peer-to-peer operating system adds some unique touches for ease of use and administration.
Hayes Microcomputer Products, Inc.
P.O. Box 105203
Atlanta, GA 30348
404/441-1617
Reader service no. 676

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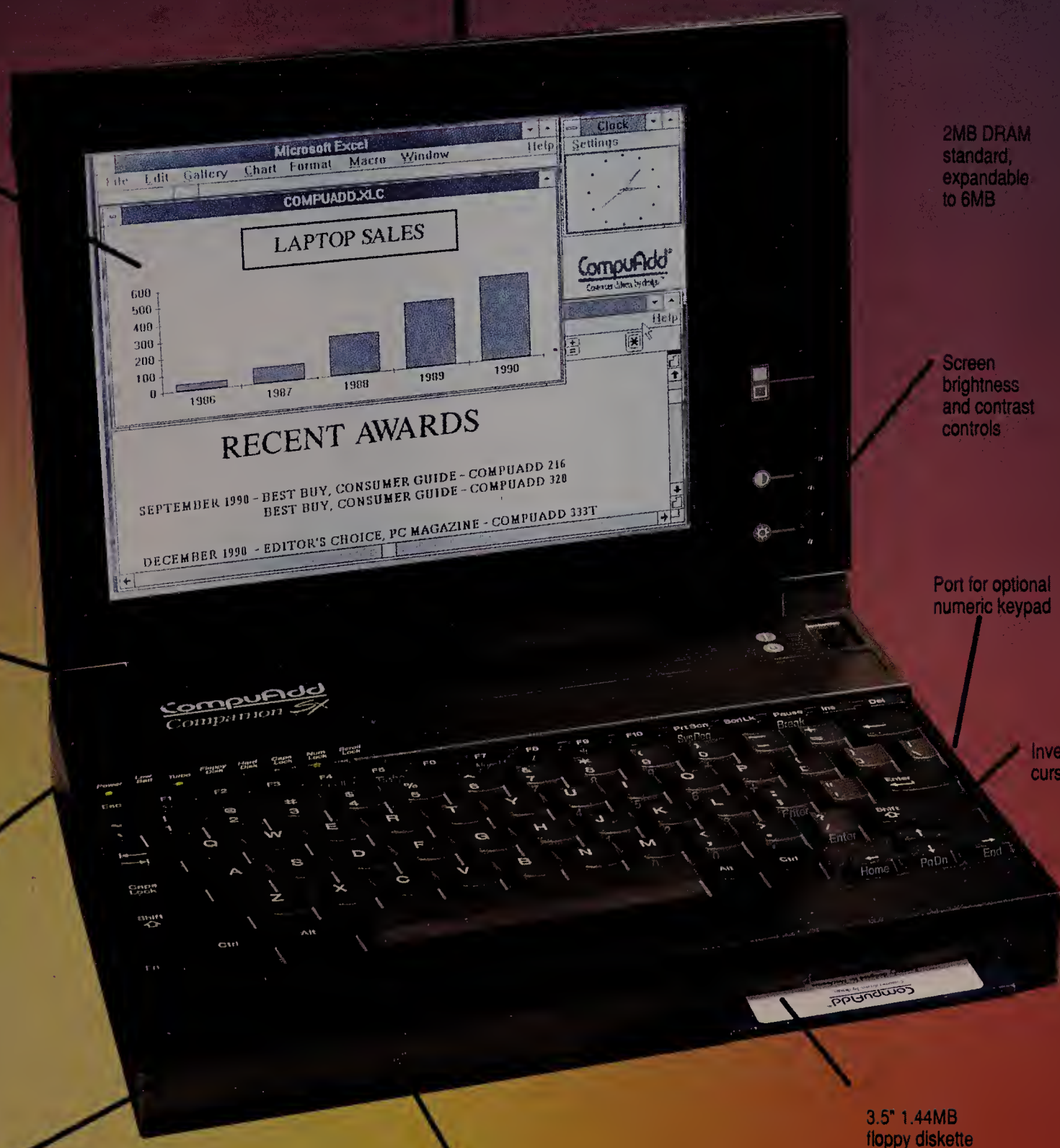
CompuAdd CompanionSX™
Heavyweight Power Travels Light!

Only $3595!

C O M P U A D D

Lightweight 386SX Notebook Packs Heavyweight Features!



10" diagonal VGA screen

20MHz 386SX microprocessor

Internal slot for optional modem

Parallel, serial, PS/2 mouse, external VGA ports on back

Travel-rugged 8-1/2" x 11" x 1.8" case

Internal 20MB hard drive

3.5" 1.44MB floppy diskette drive

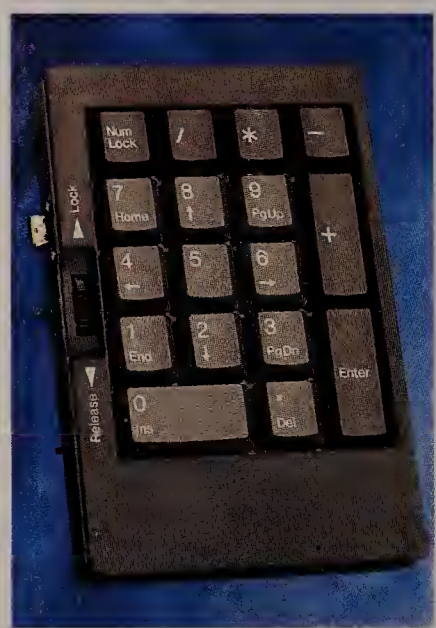
2MB DRAM standard, expandable to 6MB

Screen brightness and contrast controls

Port for optional numeric keypad

Inverted-T cursor pad

CompuAdd CompanionSX™ Only $3595!



Add on the optional numeric keypad for quick data entry.

The CompanionSX continues the CompuAdd tradition of bringing you the latest PC technology plus all the famous CompuAdd extras! Powered by the Intel™ 20MHz 386SX microprocessor, the CompuAdd CompanionSX puts 32-bit processing power in a package less than two inches thick and only 5.7 pounds — almost *two pounds lighter* than the Compaq LTE 386s/20!

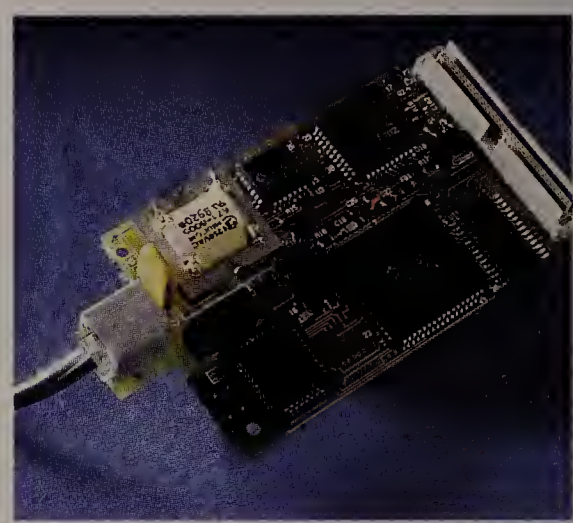
Packed with features you expect on a 386 desktop computer, this 8-1/2" x 11" notebook sports a 20MB hard drive *and* a 1.44MB 3.5" floppy diskette drive! Plus you can expand the standard 2MB DRAM all the way to 6MB.

Now you can run Windows applications on the road with the power of a desktop 386SX. And you get the security and convenience of a computer that stows in your briefcase — with plenty of room to spare!

CompuAdd extras include MS-DOS 4.01 preloaded on the hard drive. Add in CompuAdd's award-winning customer service, and you have a system that travels light but works like a heavyweight!

Standard I/O ports make peripheral hook-up easy.

This notebook-sized wonder gives you a 10" diagonal, mono VGA display that's crisp and legible in a variety of lighting conditions. And the built-in CRT interface lets you hook up your full-sized color VGA monitor for desktop use.


Add an optional modem to keep in touch on the road.

The 79-key keyboard has separate cursor movement keys arranged in the inverted -T preferred on desktop keyboards. It also has the feel of your desktop keyboard, with solid tactile response and plenty of room between keys.

Standard I/O ports — parallel, serial, PS/2 mouse and external VGA monitor — are conveniently located behind a hinged door.

You can add capability to your CompanionSX as your needs require. Plug in an optional numeric keypad or add an optional internal modem to keep in touch when you're on the road.

Carry the power of a 386SX anywhere! Call now and get an unbeatable deal on an unbeatable portable — the CompuAdd CompanionSX!

CompuAdd®

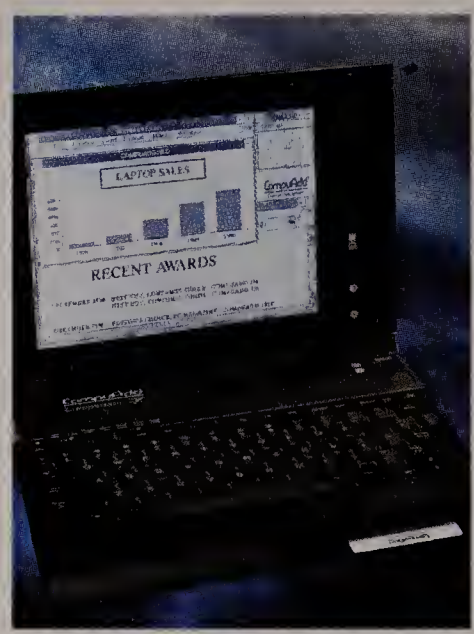
Customer driven, by design.

12303 Technology, Austin, Texas 78727

© CompuAdd Corporation, 1991. We accept MasterCard, VISA, Discover, money orders, certified checks and personal checks (please allow ten days for processing), CODs ($50 minimum order), company and institutional purchase orders (minimum initial purchase $500, thereafter $50), and wire transfers. Please add 2% to all purchases for shipping and handling (minimum $3, shipping outside the continental United States will increase cost). Add 8% for shipping and handling to APO/FPO addresses (minimum $10). Please add appropriate local sales tax. Thirty-day money-back guarantee does not include return freight or shipping and handling. Opened software, videotapes, other consumables and shipping costs are nonrefundable. All return items must be accompanied by a return merchandise authorization (RMA) number. Prices and product descriptions are subject to change without notice. CompuAdd is not liable for damage due to omissions or typographical errors. Call 800-666-1872 for a copy of CompuAdd's complete warranty.

CompuAdd CompanionSX™ $3595!

The NEW CompuAdd CompanionSX notebook continues the CompuAdd tradition of bringing you the latest technology at incredible savings! The CompanionSX is incredibly light and compact — only 5.7 pounds and 8-1/2" x 11" x 1.8". Yet it packs the power of a desktop 386SX computer!



Equipped with a 20MB hard drive and a 3.5" 1.44MB diskette drive, the CompuAdd CompanionSX fits securely and discreetly in your briefcase with room to spare. You get the same functionality and software capability you have with a desktop computer, plus options that enable you to plug into your office network, send fax documents, download data from remote computers and send error-free file transfers. All this plus a crisp, 10" VGA display!

Call today for a CompuAdd price on the latest 386SX notebook technology!

The CompuAdd 320SL Laptop upgrades our *hottest-selling laptop* to 20MHz! It packs the power of the 386SX microprocessor into a convenient laptop — at a price far below competitive models! Plus you get FREE CompuAdd MS-DOS 4.01, LapLink II communications software and a carrying case.

You'll find the crisp, clear VGA display and spacious keyboard a pleasure to use. And if you want to use your desktop color monitor and expanded 101-key keyboard when you're not on the road, simply plug them into the built-in external ports.

CompuAdd also offers portable printers, projectors and data displays to make your 320SL a complete office on the road! Check out the savings when you buy CompuAdd's 320SL Kit with Diconix printer and modem/send-only fax.

CompuAdd CompanionSX

- 386SX microprocessor running at 20MHz
- Standard 2MB DRAM expandable to 6MB
- Built-in serial, parallel printer, numeric keypad, PS/2 mouse and external VGA ports
- High-resolution 640x480 mono VGA display
- 10" diagonal LCD screen
- 20MB hard disk drive with 23ms access speed
- 79-key keyboard with 101-key emulation and 12 function keys
- *FREE!* CompuAdd MS-DOS 4.01
- Rechargeable/removeable internal battery pack
- Modular AC adapter
- Dimensions: 8.5" x 11" x 1.8"

System Price: $3595 *(62301)*

CompuAdd 320SL Laptop

- 386SX microprocessor running at 20MHz
- Standard 2MB DRAM expandable to 6MB
- Built-in serial, parallel printer, external VGA monitor, external keyboard and 5.25" drive ports
- High-resolution 640x480 mono VGA display
- 8.75" diagonal LCD screen
- 3.5" 1.44MB high-density diskette drive
- 40MB hard disk drive with 28ms access speed
  (call for optional 100MB drive prices)
- 85-key keyboard with 101-key emulation, 12 function keys and four cursor keys
- *FREE!* CompuAdd MS-DOS 4.01 and LapLink II
- *FREE!* Carrying case

System Price: $2895 *(62205)*
Kit Price: $3349 *(62208)*

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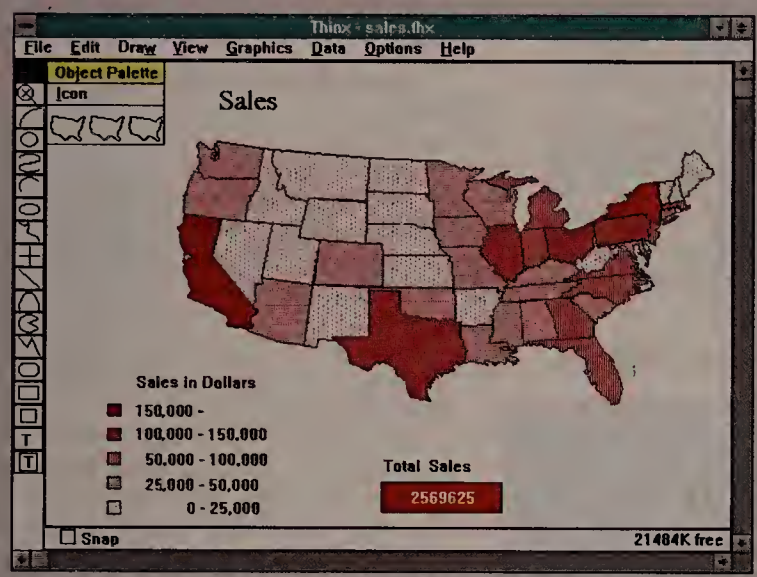
UPDATE

New Versions of Your Favorite Products

Thinx 1.1



Thinx's vector-based drawing tools let you perform what-if analyses such as sales estimates graphically.

Bell Atlantic's *Thinx* software, which lets you marry data base and spreadsheet data to objects for graphical what-iffing, has added a new training module, new applications, and bundled clip art to version 1.1. Clip art for the *Windows 3.0*–compatible applications includes basic geometric shapes and popular business graphics, all of which can be modified with *Thinx*'s vector-based drawing tools. The $495 *Thinx 1.1* also includes four ready-to-use sample applications for office planning, staff organization, product management, and sales forecasting and evaluation. The *Thinx* QuickTour uses these applications to step new users through the program. Bell Atlantic, 145 Fayette St., 3rd fl., C&P Building, Morgantown, WV 26505; 800/688-4469.

Reader service no. 694

PC File 6.0

The popular shareware nonprogrammable data manager has undergone a radical facelift. In version 6.0, *PC File*'s old keyboard-driven cascading menus are replaced by standard mouse-supporting pulldowns, along with scroll bars, windows, dialog boxes, and everything that makes up a modern interface. Another important improvement surfaces in the table view, which is no longer read-only. And simple report design is easier, thanks to predesigned options. *PC File* retails for $149.95. Buttonware, Inc., P.O. Box 96058, Bellevue, WA 98009; 800/528-8866, 206/454-1838 (fax).

Reader service no. 698

Calendar Creator Plus 4.0

Version 4.0 of *Calendar Creator Plus* goes beyond printing top-notch calendars. With its new support for the Agfa Compugraphic Intellifont system, you can print crisp type at any size between 6 and 72 points at resolutions up to 300 dpi. The program comes with two fonts and supports all Intellifont typefaces. You also can illustrate your calendar with PCX graphics—scanned logos, or clip art from *Calendar Creator*'s substantial library. *Calendar Creator Plus 4.0* retails for $69.95. Power Up Software Corp., 2929 Campus Dr., San Mateo, CA 94403. 415/345-5900, 415/349-1356 (fax).

Reader service no. 699

CheckFree 3.0

Two-way electronic mail and simplified payment inquiry and cancellation procedures are two of the new features in *CheckFree 3.0*, the recent upgrade to the electronic bill payment package. *CheckFree* users will now receive inquiry replies electronically any time they log into the service. The program also features new hot keys for quicker navigation through menu options; mouse support; and more detailed information on the merchants you regularly send payments to. Version 3.0 exports in *Microsoft Excel* file format. *CheckFree 3.0* retails for $29.95. Upgrades are free for registered users. CheckFree Corp., 720 Greencrest Dr., Westerville, OH, 43081; 800/882-5280, 304/284-1350 (fax).

Reader service no. 695

R:base 3.1A

R:base 3.1A lets you more easily integrate your other applications into *R:base* as menu items. By including those applications as selections on the main menu, you can shell out to them and then return to exactly where you left off. Version 3.1A is the first installment in Microrim's plan to upgrade the $795 *R:base* every four months. Each upgrade is $99; a year's worth is $129. Microrim Corp., 15395 S.E. 30th Pl., Bellevue, WA 98007; 800/248-2001, 206/746-9350 (fax).

Reader service no. 696

Compaq Intelligent Array Expansion System

Is *Windows 3.0* using more room on your home PC than you anticipated? Now you can pack a Compaq Systempro multiprocessor server with almost 20GB (that's gigabytes, with a *G*) of fast hard disk. The Compaq Intelligent Array Expansion System ships with 2.6GB standard plus a 32-bit controller for a trifling $21,999. You can expand storage to 9.1GB by adding five 1.3GB drives at $9099 a pop, and then repeating the process to reach the maximum. If your Systempro started with its normal complement of 1.7GB, you'll need only $134,988 to bring that up to 19.88GB—more than enough for those new *Windows* utilities. Of course, the Systempro and tape backup are extra. Compaq Computer Corp., P.O. Box 692000, Houston, TX 77269-2000; 800/345-1518.

Reader service no. 700

For more information about any product, contact the manufacturer or circle the number on the reader service card.

After I Bombed with dBASE, I Almost Gave Up Automating Our Invoices...

Simpler Than dBASE and Paradox — More Powerful Than Q&A!

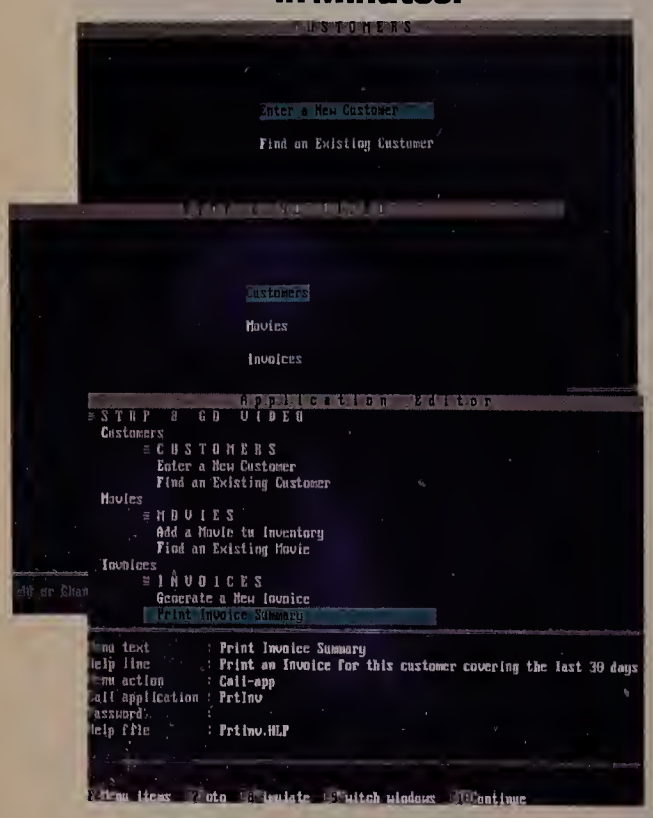
At our Monday morning staff meeting, I announced I was going to automate our invoicing system later that afternoon. Skepticism ran high. "Paul, you promised me an application like that two years ago," said Marge. "You couldn't do it and neither could that dBASE programmer you hired. It'll never happen."

On the other side of the room, Tim, a new employee whispered to Richard, "I didn't know the boss was a programmer too." "He's not," said Richard. "Couldn't write code to save his life. But he keeps trying because he thinks it's vital to the business."

I had already tried three times before to program a database: first with dBASE (much too complicated). Then I tried Q&A (not powerful enough). Then I bought Paradox (just like dBASE). All were either too complicated or not powerful enough.

This time I was confident. Why? Because I just bought Alpha FOUR, the powerful database for non-programmers like me. I spent 45 minutes over the weekend with Alpha FOUR's audio cassette tour. So I knew how easy application designs with Alpha FOUR would be, even the first time. I knew within hours, I'd be able to build a fully relational customer tracking and billing system, complete with custom menus, beautiful screens, extensive help messages and automatic error-correction for trouble-free data entry. And that's exactly what I did. You should have seen Marge's face when the first, perfectly formatted invoice came off the printer!

I Developed My Application in Minutes.



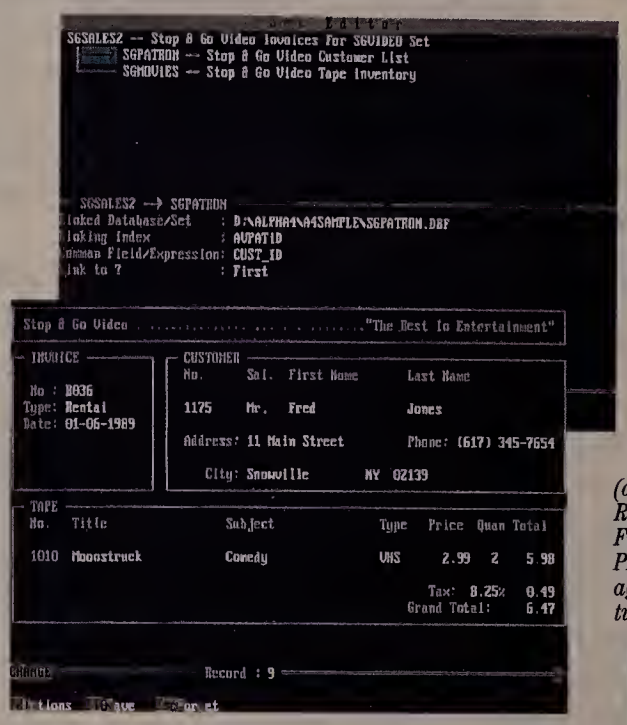
First, I needed a system of menus and sub-menus. Was I ever surprised to see how easy that was! With Alpha FOUR's "Application Editor" I wrote an outline of my menus and sub-menus. (Look at the screen.) Alpha FOUR automatically created my multi-level menus right from there. Changing my menus was just as easy. I inserted and moved a few around until I got it just right — nice and simple for my new employees.

I Made My Data Entry Bulletproof.

I've got a high employee turnover rate, so I needed something simple that a new hire could run right from the screen. I wanted my system absolutely safe and secure, so no "accidents" or mistakes could damage the data I've worked so hard to gather. That's when I really started to appreciate the well-thought-out way Alpha FOUR works. The "validation" capabilities ensure data gets entered correctly. I set it up so Social Security numbers must be 9 digits long (otherwise a custom error message is displayed).

When I enter a new customer, Alpha FOUR automatically skips over unneeded fields (determined by my validation rules). And best of all — I use "lookup" fields whenever I can. So when I get to the "Customer Type" field, a window pops up with my choices. All I do is highlight and hit ENTER. No chance of an error!

I'll Never Enter Data Twice Again.



I always ran out of power with other simple-to-use databases; they weren't relational, meaning I couldn't link up separate files that share a common field. But with Alpha FOUR I easily created different databases for customers, invoices and inventory, and linked them all together just by drawing the links between the databases on the screen. (Look at my screen.) Now, we never have to enter the same information twice. I can display and edit information from up to 10 databases on one screen all at the same time. Before, when I changed a customer's address, I had to do it in 3 different places. Never again. And my database files are so much smaller now — because the actual data is only stored in one database.

Forms and Reports Look Great!

Alpha FOUR's Report Writer was even more impressive. I "painted" reports and invoices on-screen. They looked exactly like I wanted them to — much better than our old paper forms. This "What You See Is What You Get" approach to report writing gives me the flexibility I need to create meaningful and detailed reports that really get my point across.

SPECIAL PRICING
$549 VALUE JUST $99.00!

Totally dBASE Compatible.

I was delighted to hear Alpha FOUR is totally compatible with dBASE .dbf files. Our mailing list went right into the new application without even having to be converted! And when my Alpha FOUR application grows, it'll import those Lotus 1-2-3 files used over in accounting. In fact, Alpha FOUR can import and export Lotus 1-2-3, Symphony, VisiCalc, PFS, MultiMate, WordPerfect and other packages.

And Now I Get Fancy...

First I breezed through the tutorial just to get a fully operational application, but now I have the time to dress it up and make it fancy. First I'll change my menus to 3D boxes for the menu selections, and change some of the colors here and there. Alpha FOUR makes it all so easy. Then I'll customize some of the data entry screens so they look just like the paper forms the employees are used to working with. I know — I'll call up Alpha's free Bulletin Board Service and get some tips from other Alpha FOUR users.

In the future, I'll use Alpha FOUR's "Documentation" program to print out a full report of my database design, complete with all the details. That way, someone else can pick up where I left off and further expand the system.

SAVE $450 With This Ad!
NOW JUST $99!

If you already have any database software, integrated package* or mail list manager, or if you are currently using your spreadsheet to manage data, you can upgrade to Alpha Four for just $99.

**Qualifying packages include programming databases (dBASE II, III and IV, Paradox, Clipper, Foxbase Fox Pro, Revelation, etc.), flat-file databases (Q&A, PFS:Professional File, Rapid File, etc.), integrated packages (Microsoft Works, PFS:First Choice, Lotus Works, etc.), and mailing list managers (FastPak Mail, etc.) or spreadsheets with databases (Lotus 1-2-3, Quattro Pro). Retail price $549.*

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Alpha FOUR Version 1.1

CQ3455-5 **Alpha FOUR V1.1** 5¼" **$99.00**
CQ3455-3 **Alpha FOUR V1.1** 3½" **$99.00**

Regular Tiger price $319. Hard disk, 360kb, MS-DOS 2.0 or above, 512kb RAM. Includes over 40,000 Zip Codes with corresponding cities and states — completely cross-referenced for easy fill-in.

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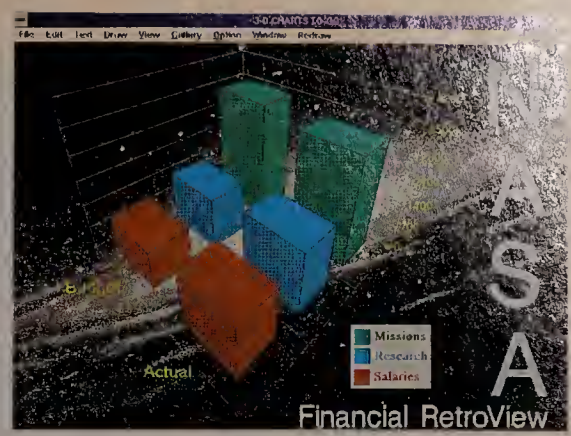
Eye-Stabbing 3-D Charts for Use in Lotus, Excel, PageMaker and Others.



3-D CHARTS TO-GO Makes Numbers Sing in 3 Dimensions.

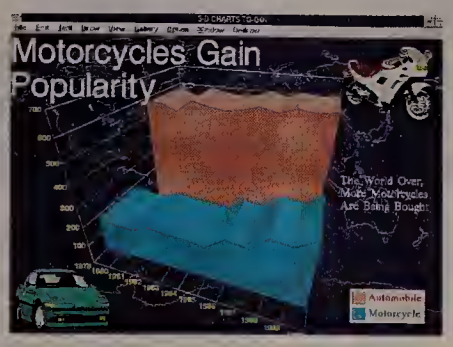
Why settle for two-dimensional charts when you can create explosive 3-D charts in just seconds with 3-D CHARTS TO-GO? This easy-to-use system will produce 3-D Pie, Bar, Area, Text and Line charts instantly, using your existing Excel numbers through its advanced clipboard. The innovative "split-screen" feature allows you to see both the data and the chart together for fast editing — you don't have to flip-flop between two applications when you create charts. And 3-D CHARTS TO-GO will give you three different chart views: Perspective, Isometric and Oblique.

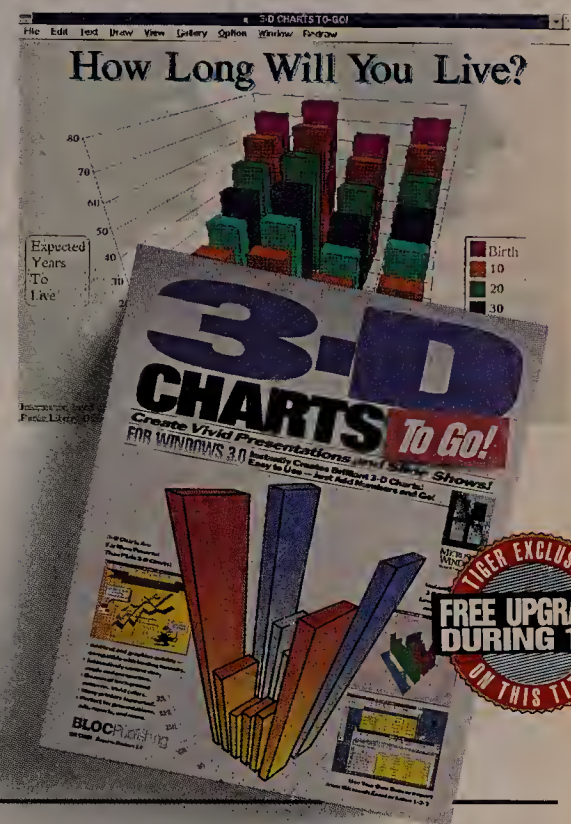
Control Size, Angle, Color, Type and Reproduction Quality.

3-D CHARTS TO-GO allows you to interactively control the size of your charts — so you see the adjustments as you make them! Sizing is as easy as clicking to get the exact size you need. Click again and adjust the viewing distance, click once more and change the rotation angle to add unique perspective to your chart. This rotation-angle control allows enormous flexibility in presenting your charts so that the data is clearly displayed. Quickly select from 17 different chart drawing patterns and 8 foreground and 8 background colors. Want to get crazy? Click to create a host of available special effects on the background and shadows to enhance the three-dimensional effect.

There's more, like the ability to select your choice of chart quality: Draft, Fine Black and White and Fine Color. And 3-D CHARTS TO-GO gives you creative freedom when adding type to your charts. Your chart's title, subtitle, descriptive lines, labels, legend and footnotes can all be individually sized, colored and employ different fonts.

What makes 3-D CHARTS TO-GO even more impressive (and useful) is its ability to use data from Excel (and many other Windows-based applications). You'll quickly export numbers to 3-D CHARTS TO-GO without exiting Excel. You can easily merge up to 10 individual charts, print them together and perform fast, accurate data comparison. If you're a PageMaker user, you can enhance documents containing financial information and grids following the same simple steps. And since 3-D CHARTS TO-GO supports .WMF, .PCX and .BMP file import formats, you can add professionally prepared clip art images to your charts to make them even more visually striking.





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3-D CHARTS TO-GO

CQ1300 **3-D CHARTS TO-GO** 5¼″ & 3½″ **$99.95**
Requires Windows 3.0 and 640K.

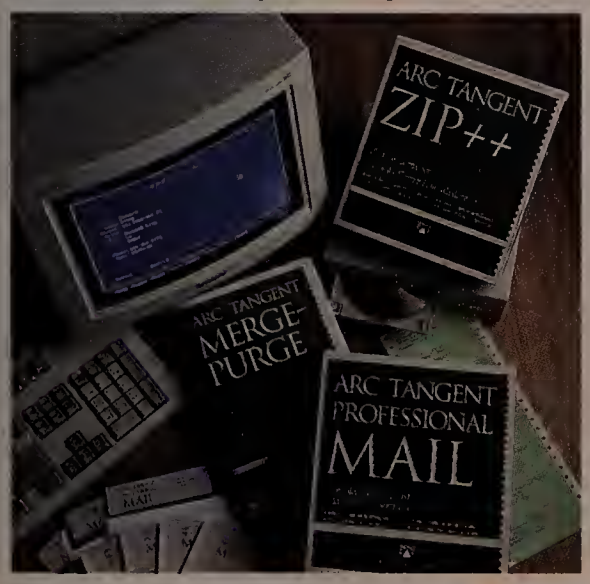
From 29 Cents to 7.4 Cents For A One-Ounce Letter!

Certified by the U.S. Post Office

Professional Mailing to the masses — that's the theory behind Arc Tangent's decision to lower their price from thousands (and requiring special hardware) to hundreds (and run on any PC).

The Cadillac of mailing list software, this is the most advanced, professional-level package available on any PC. Certified by the U.S. Postal Service, you get a highly compressed version of the 3.2 gigabyte U.S. Post Office file on a single CD!

Eradicate bad addresses by checking your list against every valid address in the United States. Put advanced, professional-level features on your desktop that before were only available to huge mailing houses. Slash costs to the bone and get increased response from your mailings.



The Arc Tangent system is engineered for substantial mailing lists and saves you thousands of dollars. It could pay for itself on the first mailing!

Professional Mail

The heart of the system, Professional Mail generates and manages your entire mailing — including these advanced features:

- Database fully customizable; unlimited number of names and addresses
- Eradicate duplicates — even complex "sound-alike" dupes on up to 6 lists at once
- Presorting of 1st, 2nd, and 3rd Class Mail
- Supports 5-digit, Zip+4, Zip+4 Barcode, Basic Bulk, and Carrier Route
- Prints required Post Office reports
- Samples new lists (Test a list by mailing to every 10th address.)
- Highly personalized form letters
- Print any mailing label, including Zip+4 Barcodes
- Convert valuable lists from dBase and others
- Novell network version available

ZIP++

With a CD of every valid address in the U.S, ZIP++ cleans your lists for the highest accuracy you can get. Give it an address and ZIP++ will tell you what postman will deliver it! (And print the Carrier Route with the address.) Save money on postage and printing, improve the quality of your mailings, and get the best results possible.

- Correct bad addresses
- Missing City? ZIP++ can still find it.
- Insert Zip+4 codes
- Insert Carrier Route codes
- Compare each address against the USPS database of all mailing addresses in the US
- Highly accurate — updated 4 times a year
- Slash rates with Zip+4 codes
- Slash rates even more with Carrier Route codes
- Bare-bone rates with Barcodes printed on dot-matrix, laser, or direct-impression printers
- Certified by the U.S. Post Office for accuracy

Merge-Purge

Rid your lists of bad and undeliverable addresses and get real savings. Merge-Purge has the same professional-level features of Professional Mail, but is sold separately for those who want the power of Professional Mail's merge-purge capabilities while managing their lists with dBase, R:Base, ASCII and other general-purpose database files.

- Detect dupes, near-dupes, or "sound-alike" dupes on up to 6 lists at once.
- Merge dupes from 6 files into one file
- Handles any size list

Arc Tangent, the leader in the mailing-list industry, offers the most powerful package available on any PC, you'll save thousands — both on postage rates and printing costs. And this industrial-strength system is easy enough for any PC-user to understand.

ARC TANGENT

Arc Tangent

CQ8600 **ZIP++** 5½″ & 3½″ **$195.00**
CQ4065 **Merge Purge** 5½″ & 3½″ **$149.00**
CQ4060 **Professional Mail** 5½″ & 3½″ **$695.00**
Professional Mail and Merge Purge require a hard disk. ZIP++ requires a CD-ROM reader.

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The Intelligent Grammar Checker.

Improve Your Writing by Checking Grammar, Style, Punctuation, and More.

In business, you're judged by what you say — and by how you write. Nothing can kill the confidence of a prospective customer or client faster than a proposal littered with grammatical, usage and punctuation errors.

The fact is, there's no excuse for sloppy, error-filled written communication. Each letter, report, proposal, press release or other business document you prepare should represent you as a professional.

RightWriter Is the Premier Grammar and Style Checker.

It's designed to flag errors in your writing from a rule base of over 5,500 — including rules of grammar, style, usage, punctuation, sentence structure, subject-verb agreement and more. RightWriter produces a copy of the document and performs its analysis. Then displays (or prints) your document with flagged errors and explanations. These explanations are your guide to better writing. The result: clear, crisp documents that deliver your ideas with maximum impact.

You use your word processor to create your document as you normally would. When you're ready to use RightWriter, you simply press a two-keystroke sequence.

How RightWriter Knows When Your Writing is Wrong.

RightWriter proofreads your documents using two artificial intelligence (AI) technologies called parsing and expert systems. Each technology has a separate, unique function, but together they rely on one another to identify parts of sentences and to locate errors.

Parsing performs the critical function of sentence dissection. It first identifies sentences' individual parts, breaking each sentence into major phrases and looking for both dependent and independent clauses. Parsing goes further by identifying the subject and predicate of each clause and noting the word's part of speech. This technology, for example, can tell the difference between "can" used as a noun and as a verb.

The expert system relies on the parser to break down the sentences so it can determine their accuracy. RightWriter's expert system examines your writing, judges the accuracy, and suggests improvements without your making any specific query.

Now Runs From Within Eight Word Processors.

RightWriter's interface works within eight word processors: WordPerfect, LetterPerfect, Microsoft Word, WordStar, Professional Write, Q&A, Q&A Write and MultiMate Advantage II.

Compatible With:

Microsoft® Works		*pfs: First Choice®*
Bank Street Writer®	*Microsoft® Write*	*Q&A Write®*
DeskMate Text	*Multimate Adv.® I & II*	*Samna®*
Edix/Wordix®	*Multimate®*	*SideKick®*
Enable®	*New Word®*	*VolksWriter® (Deluxe, Plus & 3.0)*
HomeWord II®	*OfficeWriter®*	*WordPerfect®*
IBM Writing Asst.®	*PC-Writer®*	*WordStar®*
Leading Edge®	*PeachText® 5000*	*WordStar 2000®*
Microsoft® Word	*pfs: Write®*	*XyWrite®*
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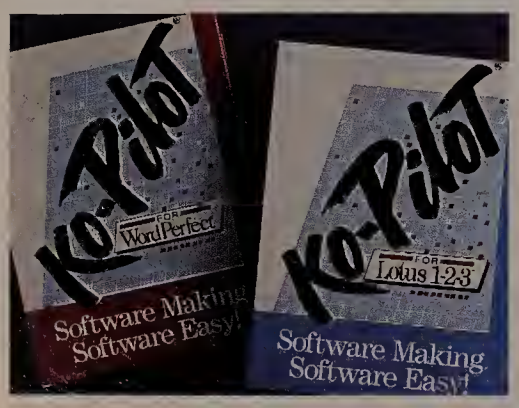
CQ3366 Mac Version	$79.95
CQ3367 Network 5 Pack	$299.00

Never Read a Manual Again!

On-Line Instructions for WordPerfect 5.0 & 5.1, and Lotus 1-2-3!

As the popularity of WordPerfect and Lotus' new releases sweep the industry, more users are attracted to their incredible power, design and functionality. But learning these programs can be some work. Now anyone can quickly master WordPerfect and Lotus 1-2-3 without spending days or even weeks with the manuals.



Ko-Pilot is available from anywhere by just hitting a function key, then it takes over, outlining your options from a pull down menu. You won't have to memorize any complex commands or series of steps.

For WordPerfect 5.0 & 5.1

WordPerfect has become the standard word processing software for businesses of all sizes. Now, users unfamiliar with WordPerfect can virtually teach themselves in just a matter of hours.

Advanced users will find Ko-Pilot helpful in using features they never learned — or they didn't know existed.

Ko-Pilot for Lotus 1-2-3.

The brilliance of the electronic spreadsheet doesn't have to be intimidating. Ko-Pilot takes you by the hand and leads you through any operation with just a keystroke. Hit F1 and pull down menus allow you to perform @ functions, record and use macros, move ranges, set up your printer and dozens of other Lotus features that could take weeks to master.

INSIGHT RESOURCE INC.

Ko-Pilot

CQ3430-5 For WordPerfect 5.0 & 5.1 5¼"	$89.95
CQ3430-3 For WordPerfect 5.0 & 5.1 3½"	$89.95
CQ3440-5 For Lotus 1-2-3 5¼"	$89.95
CQ3440-3 For Lotus 1-2-3 3½"	$89.95

System Requirements: IBM PC, XT, AT, PS/2. Wordperfect requires 640K; Lotus requires 512K. Lotus 1-2-3 Ver. 2.2 w/3.1 available 1st quarter '91.

Automatically Turn Ideas into Diagrams...

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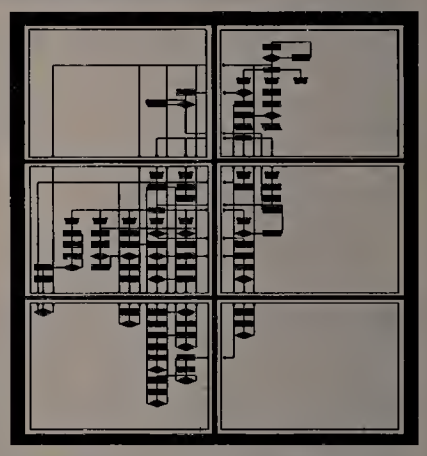
How do you convey to a client how projects flow in your company? How can you ensure new employees really understand the procedure for using a purchase order, or when to use express shipping? With allCLEAR, your thoughts are instantly expressed as pictures — accurate, presentation-quality tree and flowcharts. All created without any preplanning or drawing on your part.



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The Long-Awaited New Version! The Winningest Lottery System In The World!

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Hundreds of New Innovations for Higher Winnings!

The Complete Lottery Tracker & Wheeler gives you the ability to track and play as many lotto games as you want, it provides the tools to produce charts, stats, reports and your own customized programs for the world's most popular number wheeling systems. And now you can create trend charts, analyze past winning numbers any way you like, produce accurate statistics on frequency, recency, bell curves, percentages and "hot" or "due" winning numbers.

Version 4.0 Designed by the Pros.

Lottery professionals and enthusiasts agree that The Complete Lottery Tracker & Wheeler is the one system powerful enough for the serious player. They play many state lotteries on a consistent basis, carefully tracking the results and formulating winning strategies. The developers of The Complete Lottery Tracker & Wheeler listened what they had to say about the science of winning lotteries and incorporated a lot of their techniques into this new version.

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Now you can have the astronomical knowledge of the centuries right on your PC with new EZCosmos. Whether you're a casual observer, aspiring stargazer, or professional astronomer, you'll find EZCosmos an exciting and complete reference tool.

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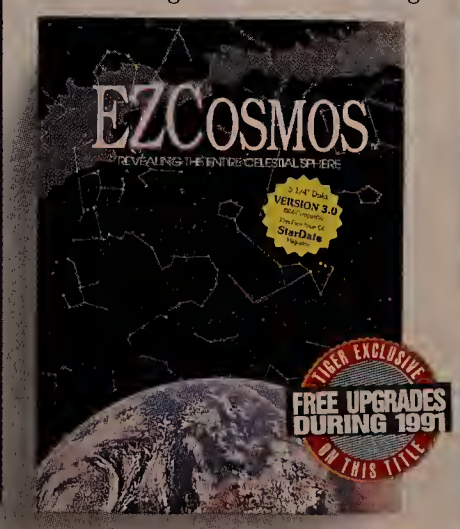

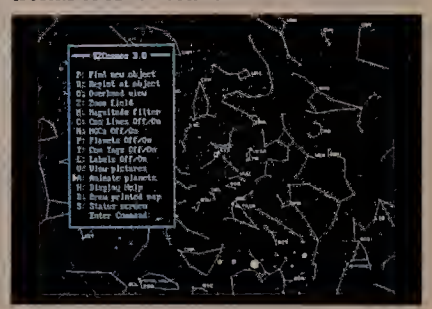

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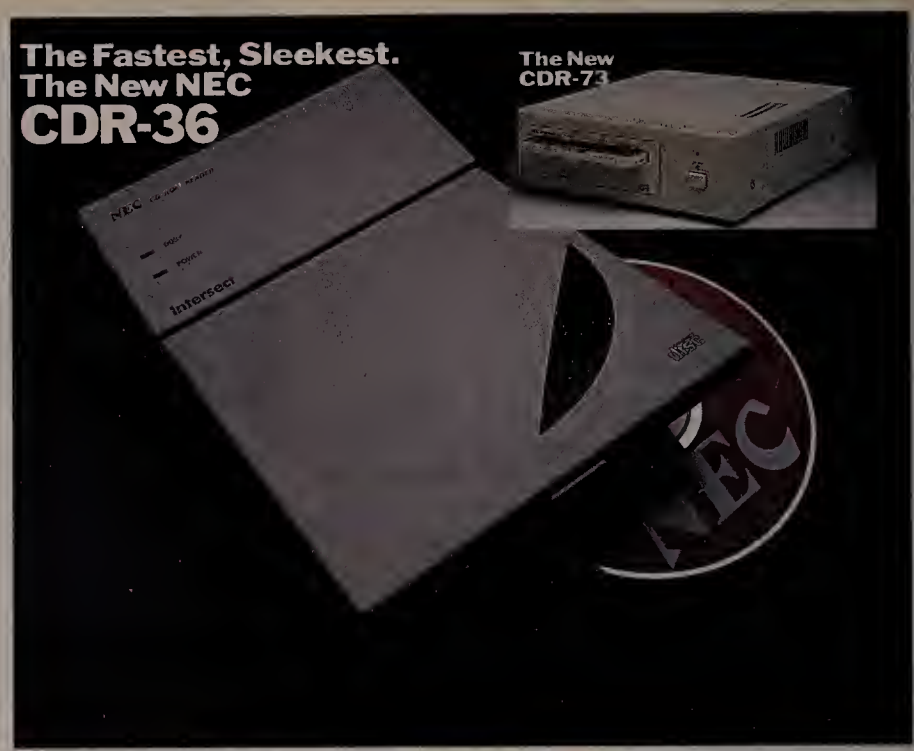

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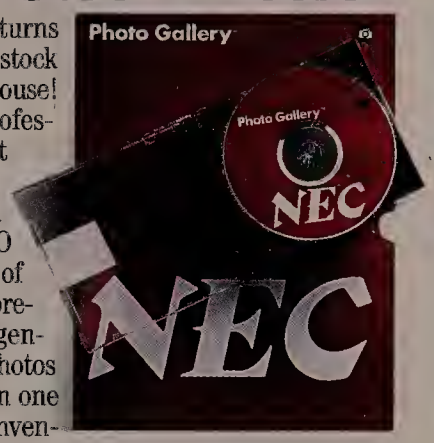

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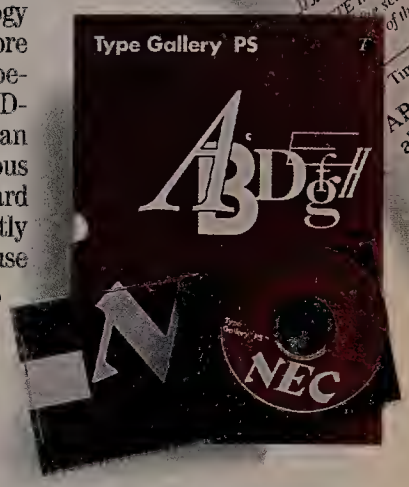

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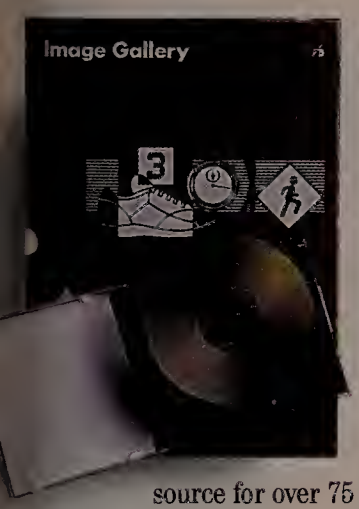

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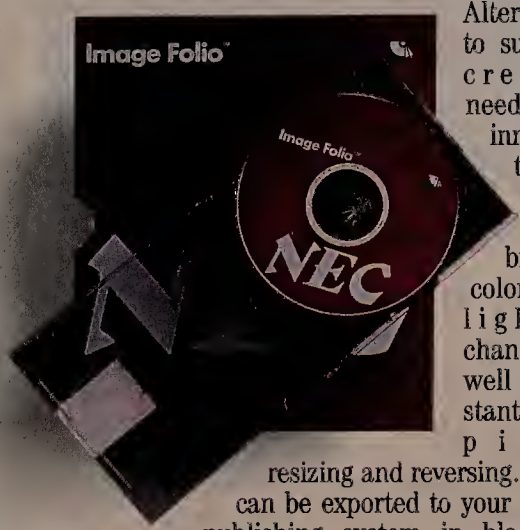

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Unmatched Resolution, 64 Levels of Gray, Scans to 640,000 Dots per Square Inch!

There is no other system available that can scan images, text, logos, photos, illustrations and designs with more precision than the Marstek M800W scanner and the incredible battery of image processing and OCR software in this exclusive Tiger-Software bundle!

The Marstek M800W scanner's unmatched technology delivers the cleanest images from any original. This is a professional scanning and imaging package, unlike anything else available today, allowing you to capture anything on your screen by simply passing the scanner over it! And its OCR (optical character recognition) software allows you to scan text from anywhere. Just pass the scanner over it and use it in any application — without re-keying.

The Marstek M800W also includes: Image-In Scan & Paint, Image-In Plus, Image-In Read and Image-In Vert (an $1100 value), for fine tuning your scanned images as well as providing a toolbox of sophisticated image manipulation features. Perfect for desktop publishing applications, as well as the new breed of Windows word processors, the Marstek M800W is extremely flexible, featuring advanced "yellow/green" scanning lights to capture the finest details — even from originals the size of a postage stamp! And the M800W's special Inverse Scanning capability creates a wide variety of special effects.

800 DPI Plus an Unbeatable Software Package!

While 800 DPI technology will make your images scream, it's the software Tiger has assembled to accompany this technological marvel that makes this offer irresistible! Over $1100 in free software to crop, flop, invert, alter, enhance, posterize, retouch, digitize, resize, smooth and pattern-fill images — and to read, translate and convert text from any printed page for use in your documents. This image reading/processing software is used in higher-end imaging and publishing systems. And because it's so simple, anyone can produce the highest quality results with very little effort. Everything you need is included — the scanner, interface kit, Image-In software and comprehensive user's guide.

B O N U S !

FREE with The Marstek M800W Image-In & Perceive Personal

Image-In: The Premiere Image Processing Software...

Introducing the Image-In Scanning system. Here's the toolbox of highly advanced, simple-to-use software products for Windows that allows you complete control over your scanned images — including painting, gray scale, image processing, OCR (Optical Character Recognition) and RTV (Rastor To Vector) conversions.

Perceive Personal

For Marstek Model 105W Plus and 800W Hand Scanners.

Perceive Personal now brings advanced, full page OCR (Optical Character Recognition) to PC/AT compatible hand scanners. It combines the power of true "omnifont" (automatic) OCR with the convenience of full-page text recognition in the powerful Microsoft® Windows environment.

Marstek

Marstek	
CQ6180 M800W w/Image-In & Perceive	$399.00
CQ6175 M800W w/Image-In ONLY	$299.00
CQ6190 M105W (400 dpi) w/Image-In & Perceive	$329.00
CQ6185 M105W With Image-In ONLY	$229.00
CQ6140 Marstek Mouse E22	$59.00

Powerful Windows Performance, Amazingly Modest Pricetags.

Perfect Screens, Lightning-Fast Memory, Extra Ports.

Boca Research, the price-performance leader in the microcomputer industry, comes through with a full range of solutions at prices you can afford.

BasicVGA. The lowest-priced, 16-bit, standard VGA board made in North America. Available in two models — 640×480 or 800×600.

SuperVGA w/512KB. Add 800×600 in 256 colors and 1024×768 in 16 colors. The 16-bit design is 50% faster than 8-bit boards.

SuperVGA w/1MB. All the above plus 1024 x 768 in 256 colors in either interlaced or non-interlaced modes.

BOCARAM/AT Plus. Boca memory boards (in your choice of DIPS or SIMMS) are top-rated by PC Week and approved by Novell. Expandable to 8MB per board and available in four configurations *(see the price box).* Supports conventional, extended or expanded memory.

IO/XT. Add extra serial and parallel ports in any PC. The IO/XT has a built-in clock/calendar and is available with one serial and one parallel port — or two serial and one parallel port.

IO/AT. For ATs and above, the IO/AT does not include a clock/calendar. Also available with two serial and two parallel ports (including one bi-directional parallel port).

BOCA boards come with a 5-year Warranty, free technical support, and a 24-hour BBS.

Boca Boards

IO/XT or AT w/1S & 1P	$65.00
IO/XT or AT w/2S & 1P	$70.00
IO/AT w/2S & 2P	$75.00
AT Plus SIMM w/0MB	$120.00
AT Plus DIP w/0MB	$130.00
AT Plus DIP or SIMM w/2MB	$280.00
AT Plus DIP or SIMM w/4MB	$399.00
AT Plus DIP or SIMM w/8MB	$699.00
Basic VGA 640×480	$70.00
Basic VGA 800×600	$75.00
Super VGA w/512KB	$135.00
Super VGA w/1MB	$165.00

If You Work with Images, DoDOT Is a MUST!

DoDOT Starts Where Paint Programs Leave Off.

I work with images and screen captures all day long, and DoDOT is one of my vital tools. I do the graphic images here at TigerSoftware. DoDOT is the only application I've found that can capture a Windows screen with all 256 colors. DoDOT gives me the file conversions I need to handle anyone's image, no matter what format it's in.

If you work with images like me, you know the barrier you hit when you hear, "Sorry, but I can only take TIFF files." Or how about getting images from a Mac to your DOS machine? This is when I load DoDOT. DoDOT can open, convert, and save in a multitude of valuable formats. For the Mac, the PC, in or out of Windows, I count on DoDOT.

See It? Like It? Capture It!

It's fun to work in Windows, and it's even more fun when you can capture what you see on the screen to use in your paint program, word processor, or just to print. DoDOT will capture the entire screen, any window, or a specific area you define — and then save it in your favorite format. Cut & paste, mix & match and rearrange your images to suit your special needs. For the professional, there are vital tools like color separation, dithering, palette editing, and more.

DoDOT Does Dots.

Images are basically dots on your screen. DoDOT takes total control of your dots and puts them at your disposal. Convert color images to shades of grey, or convert to different patterns of black & white for printing (called dithering). Invert from Black/White to White/Black. Separate colors so a local print shop can print color images in your publication.

Halcyon Software

DoDOT

CQ5040 **DoDOT** 5¼" & 3½" .. $139.95
Requires Windows 3.0 and 640K.

TIGERSOFTWARE FREE FEDERAL EXPRESS · (INT'L ORDERS 305-443-8212) TO ORDER **1-800-888-4437**

Circle 259 on reader service card

Turn Your PC into a Fax Machine!

Send, Receive and Re-route Faxes — Even Remotely!

Your PC is the perfect fax machine: it connects to a modem, it has powerful printing capabilities and contains plenty of storage space. It allows you to use software that automatically transmits faxes at a certain time, or even to send faxes from a remote computer, like your client's office (fax yourself the report you forgot to bring!). Your PC's print drivers allow you to send crisp, clean facsimile documents right from your desktop or laptop PC. You could preview the document, change fonts, add special effects, transmit at 9600 bps and more. Of course, using your PC would make it much easier to manage and archive your faxed communications. And, using your laser or dot-matrix printer, you can receive faxes ON PLAIN PAPER. All you need is the compact, affordable little board known as Fax96.

Tiger presents the price-busting fax board that has swept the industry, and captured *PC MAGAZINE's* "Editor's Choice" with its flawless reliability record. And Fax96 is fully Group 3 compatible. No other fax board can match Fax96's incredible 99.91% error-free transmission rating. In speed tests, using identical documents, Fax96 delivered a finished facsimile over fourteen seconds ahead of the nearest finisher. Fax96 is fast, because it doesn't have to scan documents before transmitting, so your faxes cost significantly less. And "scanless" document imaging eliminates dirt and transmission "noise" that translate to dots, lines and patterns on the finished fax.

Send, receive, print and manage your faxes — quickly and easily with the award-winning Fax96.

Features:

- Full 9600 BPS Group III compatibility.
- Background Receive operation.
- Automatic Transmittal Sheet generation.
- Automatic Redial.
- Automatic Log of sent and received messages.
- Compatible with laser and dot-matrix printers.
- Shares your existing phone line.
- Remote control for sending faxes.

Direct Scanner Control.

With your scanner, Fax96 will directly control the scanner and send the image as a fax. Fax96 supports all the popular scanners. If you want to use your own scanner program, simply save the image as a .TIF or .PCX file, then send it from Fax96.

Share One Phone Line.

Don't install another phone line for your fax. Save money with advanced "1-Liner" faxboard. 1-Liner shares your existing phone line, meaning it will automatically recognize and answer another fax machine, or pass a regular voice call to your telephone answering machine.

Fax It Fancy.

Big letters, small letter, in the typeface of this paragraph, or maybe the typeface used in the headline — you can fax fancy with "Faxography" software. Really create an effect at the other end with professional and impressive faxes.

FRECOM

Fax96

CQ6240 **Fax96 board w/software**	**$195.00**
CQ6250 **1-Liner board w/software**	**$295.00**
CQ6260 **Faxography Software**	**$99.00**

PC, MS-DOS 2.1 or higher, 512 KB RAM, hard disk.

If You Bill Your Time

Easily Prevent Billable Time from "Slipping through the Cracks."

Do you know which jobs are the most profitable and which ones are a complete waste of time? Do you know which clients have outstanding accounts receivable? Are you billing all of the time you're entitled to or do billable hours "slip through the cracks?" For people who bill for their time, tracking it may be the toughest job of all. Many professionals, including architects, law firms, designers, CPAs, ad agencies, engineers, repair services, project managers and others are turning to the software system designed specifically to calculate and report all time spent on each job.

Timeslips® III is fast, easy, flexible time and expense recording along with a complete set of financial and productivity analysis tools. It's so simple to use, it practically runs itself, and features a pop-up timer function that can be accessed anytime — from within any application.

Different clients require different bills. With Timeslips III you have the power of custom billing.

- Have a client on the phone? Press *TSTimer's* hot key to track time and jot down notes.
- Returning from a business trip? Just type in your expenses.
- Spend hours writing an analysis? Tell *Timeslips III* who is paying for it.
- Want to manipulate your *Timeslips III* data? Export it to Lotus 1-2-3 or word processors.
- Need to know who's billing the most hours this month? *Timeslips III* knows.

The Time and Billing Software of Choice.

Timeslips III lets you record, analyze, and bill both time and expenses with ease and complete accuracy. In fact, many customers report up to a 25% increase in billable time once they have installed Timeslips III.

Track 250 activities, for as many as 250 people, working on 128 projects per client — with a maximum of 3,400 clients.

- Detail services by activity, expense, project, or matter with complete descriptions.
- Automate your invoice preparation with convenient macros.
- Include several types of flat fees, such as absolute, minimum, maximum or base.
- Itemize and/or include totals for hours and expenses.
- Include dates, previous balances, aged receivables, employee initials, customized messages on your bills.

FREE BONUS!

Timeslips III Speller™ — FREE!

Prevent Spelling Errors in Bills and Reports.

TSSpeller is an electronic spell-checker tailored specifically for use with *Timeslips III* time/expense-tracking and billing software. Depending on how you choose to work with it, *TSSpeller* can:

- monitor your keystrokes and report an apparent spelling error or "typo" immediately;
- check a field/block of text after entering it;
- scan all your slips (or a subset) before printing.

TIMESLIPS CORPORATION

Timeslips® III

CQ3300-5 **Timeslips III 5¼"**	**$239.95**
CQ3300-3 **Timeslips III 3½"**	**$239.95**
CQ3306 **8-User Network Edition**	**$599.95**

IBM PC, XT, AT, PS/2, compatibles with 384K.

TIGERSOFTWARE **FREE FEDERAL EXPRESS (INT'L ORDERS 305-443-8212) TO ORDER 1-800-888-4437**

Circle 259 on reader service card

Make Your PC Run up to 60 Times Faster!

Unleash Your System's Hidden Potential for Blistering Speed!

Trapped deep within the architecture of your computer lies an enormous untapped potential for speed. Unfortunately, this vast resource has been neglected because no-one could devise a way to unleash it. Until now.

FAST! is the brilliant caching system that actually increases the speed of your computer by up to 60 times! Simple to install, a snap to use, this software solution can make a stock XT outrun a full-blown 386! In tests, we loaded a 386 with FAST! and we almost blew the doors off the lab!

How Can It Be Possible?

How can a software package have such a shattering impact on my computer? Although the authors are keeping the secret to themselves, they have shared information about where the slowdowns are within your system, where the speed is trapped and what has to be done to harness it.

They do tell us specifically, that the biggest system slowdown for your system is waiting for disk reads. When you use an application, you use it in "chunks" of various sizes, depending on the functions you are performing. Sure, you load it all at once, but it's used in bits and pieces. Your system must read back and forth, searching for these chunks of programs as they are needed by the application.

A Perfectly Logical Solution...

One of the keys to the FAST! design is the addition of "intuitive logic" to the technique of caching, so your system actually anticipates what your CPU will be seeking and reads the information directly from the hard disk (or floppy) into a special buffer created within your RAM. This information is, in reality, retrieved before the system asks for it!

As a result, your CPU simply spends no time waiting for disk reads, so processing can be done as fast as the system is capable — faster than you've ever seen it! The more disk-intensive the application is, the more dramatic the increase in speed can be achieved using FAST! Database, spreadsheet and complex CAD systems, word processing, data transfer and more will achieve maximum response with FAST!

FAST! is also good for your system. By reducing the chaotic searches for data on your hard disk, it actually extends its life, reducing the damaging effects of constant wear. It's good for your software applications because they'll run leaner and faster, so you'll be more productive.

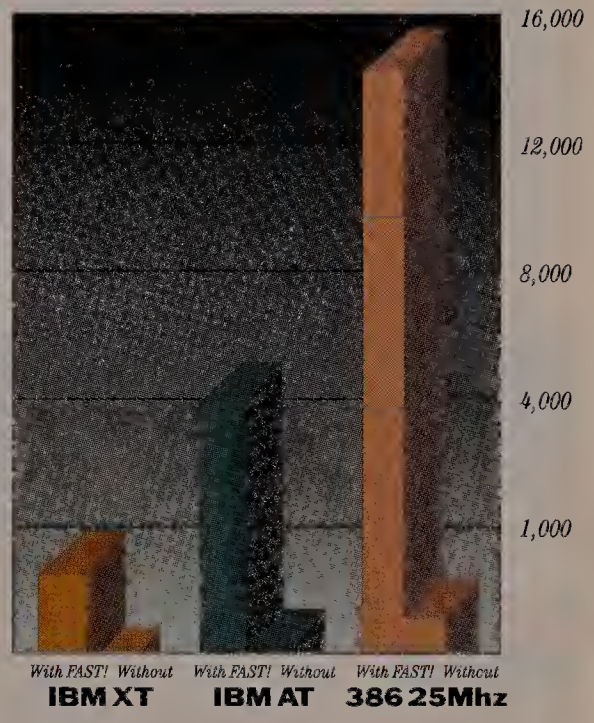
FAST! Under Windows 3.0!

Charles Bermant, author of The Windows 3.0 Comparison, wrote "One solution (to the speed problem) is to replace Windows' disk cache, SMARTDRV.SYS, with another cache. One such program, FAST!, has made my recent Windows life a lot easier. FAST! makes everything appear faster."

On a standard Drive Evaluation Comparison test, FAST! increased performance over 1700% — and 550% over Windows' caching software!

With FAST! vs. Without FAST!

Data Transfer Rates In Kilobytes Per Second



FUTURE

FAST!

CQ3460-5 FAST! 5¼" $79.95
CQ3460-3 FAST! 3½" $79.95

FAST! will run on the IBM PC, XT, AT, PS/2 and compatibles with 128K RAM and DOS 2.1 or greater. Supports fixed or floppy disk systems, and supports conventional, expanded or extended memory.

Avoid Hard Disk "Heart Attack."

Fragmentation is Inevitable and Fatal!

When your hard disk was new, it ran lean and swift, retrieving files in just a few seconds. But as you added programs and files, your hard disk became fat and sluggish. The fact is a fragmented, "dirty" hard disk can take up to 100 seconds to retrieve a file that used to take 10 seconds — ***that's 10 times slower!***

The problem? Fragmentation kills hard disk performance. It causes excessive head movement across the media, creating bad spots throughout the drive. It's aggravating and dangerous! A fragmented hard disk, left unmaintained, is almost certain to crash. That means major data loss. Disk Optimizer 4.0's sleek, *easy-to-use menu system* makes hard disk maintenance simple.

Why Optimize?

Simply everyone who owns a hard disk, and relies on the speed and convenience it gives them. But unfortunately, DOS is doing its best to slow hard disks — by breaking files up into pieces. Storing different chunks in different places. As a result, loading is slower. Sorting is slower. Everything takes longer because your hard disk has to chase around picking up and laying down pieces of your file.

After un-fragmenting with Disk Optimizer, a file that once occupied 20 different sectors in 20 different locations is now in one contiguous piece. The next time your drive reads it, there's just one place it has to look.

FREE Cubit!
When You Buy Disk Optimizer
A $49.95 Value!

SOFTLOGIC SOLUTIONS

Disk Optimizer

CQ3400-5 Disk Optimizer 4.0
5¼" $69.95
CQ3400-3 Disk Optimizer 4.0
3½" $69.95

Runs on IBM PC and compatibles. Supports DOS 2.1 and above.

Open and Run 12 Programs at Once!

Imagine switching programs on your computer as quickly and easily as you change channels on your TV! No more 10 step routines just to exit one program to work in another. Just switch and you're in your spreadsheet for work on the budget, switch you're in your word processor to zip off a memo, switch over to your database to add items to your mailing list, and then just switch back to your spreadsheet — to the exact spot you left off!

Software Carousel Release 5.0 allows you to load up to 12 programs when you begin work and simply switch between them all day long, or load several sessions of the same program, each with a different file, and snap back and forth to work on several spreadsheets, reports, letters — anything you need — all at once.

Not everyone will want Software Carousel to work exactly the same. There are a number of convenient ways to configure Software Carousel to suit everybody's needs and tastes.

New Print 'n' Run.

Print 'n' Run works by directing printer output from any application running in a Software Carousel partition into a configurable pool of Software Carousel memory. Print 'n' Run, simultaneously sends the output to the printer as fast as the printer can take it.

NEW! 5.0 Features.

New Personal Message Center lets users write and display messages on screen and automatically stack programs at a particular time of day.

And new SNIP 'N' SNAP is a powerful cut and paste facility that enables users to transfer text or numerical information from an application or file running in one Software Carousel work area to another.

FREE Double DOS!
A $69.95 Value!

SOFTLOGIC SOLUTIONS

Software Carousel

CQ3405-5 Software Carousel 5.0
5¼" $89.95
CQ3405-3 Software Carousel 5.0
3½" $89.95

IBM PC, XT, AT, PS/2 or compatibles; 256K.

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Create Dozens of Legal Documents for Home and Business.

Binding Legal Documents To Protect Your Family, Business and Property.

By simply typing answers to questions on your screen, Personal Law Firm actually "writes" binding legal documents customized to your specific situation and ready to sign. From wills to maintenance agreements; work for hire agreements to warranty documents; promissory notes and commercial leases to demand letters, Personal Law Firm gets your agreements in writing fast.

With over 500 pages of concise, informative documentation and reference, Personal Law Firm is the most comprehensive legal package available today. Just select the type of document from the Main Menu. There's plenty of background material about each document you prepare, along with explanations of the applicable laws that govern them.

The Importance Of A Will.

It's a nightmare you hope never happens. An untimely accident or illness leaves your family without a breadwinner — and without a will. In such cases, the state immediately moves in to divide your estate as it sees fit, with no regard for your wishes. Your survivors will face a long, uphill battle to reclaim what a will would have granted them instantly upon your death, without question.

Yet, 3 out of 4 people every year die without one.

Perhaps you feel that in the event of an illness or accident that leaves you completely dependent on life support, it should not be prolonged. You can create a Living Will to state in writing your wishes under specific circumstances.

Personal Law Firm covers virtually any everyday personal or business legal situation. For example, a restaurant owner from Chicago recently wrote us to relate this situation: A customer raved about his family recipe "Sauce Katrina" served at his restaurant, and asked for the recipe. Several months later, the restaurant's chef ran across "Sauce Katrina" bottled and for sale at the local epicurian shop with a label bearing the exact ingredients and the customer's name. A demand letter went out the next day from the restaurant owner to the customer asking sales of the sauce be stopped. The customer agreed. With no legal fees and no further misunderstanding.

To protect yourself against these unforeseen problems, you must get all agreements you enter into *in writing*. Personal Law Firm is the fastest, most inexpensive way to provide that protection.

Personal Law Firm Includes:

- Last Will and Testament
- Living Will
- Residential Lease
- Power of Attorney
- Living Together Agreements
- Prenuptial Agreements
- Postnuptial Agreements
- Marital Settlement Agreements
- Child Guardianship Consent Form
- Commercial Real Estate Lease
- Work for Hire Agreement
- Maintenance Agreement
- Personal Guarantee
- Release of Lien
- Promissory Note
- Trade Secret Protection
- License of Intellectual Property
- Assignment of Intellectual Property
- Bill of Sale
- Warranty Agreement
- Software Escrow Agreement
- Letter of Offer to Purchase
- Demand Letter
- Rejection of Goods Letter
- Termination of Contract
- Notice of Contract Breach
- Notice of Contract Assignment

BLOCPublishing

Personal Law Firm

CQ1050 Law Firm 5¼" & 3½" $99.95

System Requirements: IBM PC, XT, AT, PS/2 and compatibles with 256K, one floppy, a hard disk and DOS 2.1 or greater. It requires an 80-character display (color or monochrome) and will support virtually any printer.

Connect Computers Without Expensive LANs

LANs are great. You can share printers, modems, faxes, and other expensive accessories, have E-Mail for inter-office memos, even transfer files from other computers. But unfortunately you pay the price — both for the original purchase and the high cost of specialized support. You become a slave of LAN expert support forever thereafter.

But now there's a solution! Join 100,000 corporate power-users, and the U.S. and Canadian governments with the Systemizer® solution. You'll do all the things a LAN can do mentioned above -- at a fraction of the cost — with NO special expertise needed to install or use it.

There's a Systemizer solution available for any computer -- PCs, MACs, and others — plus the perfect future-benefit of connecting to full-blown LANs (like Novell), minis, and even mainframes. You'll never outgrow the Systemizer solution.

Start with the Systemizer SC — a card that plugs into any PC. Buy one for each PC and you'll reap the benefits of connected computers. Wiring isn't a problem either. Plain phone wire is all it takes. Expand when you're ready with other Systemizer components and you'll have the best of both worlds — an inexpensive and easy solution now, and an investment to build on in the future.

- Begin networking NOW, without changing existing hardware or software.
- Mix computers of all brands using other Systemizer components.
- Works with DOS and WINDOWS.
- Readily accommodates growth.
- Easy installation.

CONNEXPERTS®

Systemizer SC

CQ4040-5 Systemizer SC 5¼" $249.00
CQ4040-3 Systemizer SC 3½" $249.00
PC, XT, AT, compatibles, hard disk, uses 27K RAM.

Automatically Turn On Your PC When You Call It By Modem!

Compatible with ALL Remote Control and Communications Software.

Occasionally, we'll run across a product that's so well conceived, so desperately needed, we simply can't say enough about its importance to today's computing environment. Remote Power On/Off is just such an innovation.

Remote Power On/Off detects incoming calls and turns on the power for the PC, modem, printer and other peripherals that are plugged into its four outlets.

Don't Run Remote Computers 24 Hours a Day!

Just connect the Remote Power On/Off unit to your office PC (or any remote PC). Then, from your home or another location, actually turn on the remote PC and begin work. The included communications software allows you to access and use software applications, perform lightning fast data transfers, even use printers and other peripherals connected to the remote PC.

The remote PC does not have to be running 24 hours a day. You'll see significant savings in energy costs (estimates suggest that running a PC and laser printer 24 hours a day can cost an extra $50 each month) and you'll reduce wear on the equipment.

Compatibility.

Remote Power On/Off is fully compatible with other communications packages such as Co-Session, Carbon Copy, pc ANYWHERE, Close Up and ProComm. You can even use Remote Power On/Off with the Apple Macintosh and many mini computers.

Server Technology, Inc.

Remote Power On/Off

CQ6300 Remote Power On/Off 5¼" & 3½" $229.00
IBM PC, XT, AT and compatibles with 256K.

TIGERSOFTWARE FREE FEDERAL EXPRESS (INT'L ORDERS 305-443-8212) TO ORDER **1-800-888-4437**

Circle 259 on reader service card

The Word Processor That Lets You Get the Most Out of Windows.

For Pages That Need Drama and Flair.

When you made the decision to run Windows 3.0, you experienced the wonder of the Graphical User Interface. The fact is, there's only one Windows-based word processor that truly exploits the beauty of this remarkable operating system. Ami Pro.

Ami Pro was designed for Windows 3.0 from the ground up. It combines all of the features you counted on in your character-based word processor and combines a complete set of tools found only in desktop publishing applications.

More than word processing, more than desktop publishing, Ami Pro makes the best use of the powerful WYSIWYG environment and brings your documents to a new level of sophistication — and ironically, we found it much easier to use than Microsoft Word for Windows. Ami Pro's extremely intuitive nature makes it fast and fun to use.

View your documents as you edit them, including all text, headers, footers and footnotes. Use Ami Pro's "frames" (which can contain text for page-within-page formats) to pick-up-and-place graphics easily and position them precisely within the page. You'll see it right on-screen as you work!

Why Run Windows 3.0 if You Don't Make Use of Its Power?

Whether you're an executive who types only occasionally, or a heavy user who demands a long list of specialized features, you'll achieve impressive results with Windows 3.0 and Ami Pro. Occasional users are out of the chute faster because Ami Pro is easier to learn and use.

Heavy users enjoy features they can't find anywhere else, like tables that allow you to perform math, automatically create charts and graphs (easily import data for charts from spreadsheets with 12 styles to choose from), draw, employ its Dynamic Data Exchange capabilities with other Windows applications and even create documents using its powerful style sheets. You can't do this with any other word processor under Windows. Why not use all the power that you paid for when you bought Windows 3.0 in the first place?

Have You Always Found Mixing Text and Graphics Difficult?

Who hasn't? But you'll actually have fun doing it with Ami Pro. Today, with most businesspeople drowning in paper, your documents need the snap that graphics provide. But you've always had to wrestle with different formats, complex import commands and then work for hours to position your images neatly within your text.

Ami Pro takes a far more enlightened approach. It includes a set of style guides that you can use to quickly put together ads, multi-column newsletters, brochures, letters, reports, presentations and even your everyday correspondence.

With Ami Pro's graphics handling features (and using its "frames" described above), inserting graphics is just a mouse-click away — in exact position, exactly the way you want them. No other word processor or desktop publisher under any platform makes it as easy for you to look good in print.

EXCLUSIVE TIGER PACK

AMI PRO
***PLUS* WINDOWS 3.0**
AND
THE LOGITECH MOUSE

ALL JUST $169!

Lotus®

Ami Pro

CQ5090 **Ami Pro** *Competitive Upgrade* 5¼" & 3½". **$119.95**
CQ5095 **Tiger Pack:** Ami Pro *Competitive Upgrade*, Logitech Mouse and Microsoft Windows 3.0; 5¼" & 3½" **$169.95**
Sorry, free shipping is not included on this special offer.

A Better-Than-Windows File Manager; Create Custom Menu Selections!

File Organizer

In case you haven't noticed, Windows 3.0 isn't a FULLY graphical interface. But there is a true, fully icon-based system for manipulating files and programs in Windows 3.0. File Organizer actually replaces Windows' Program Manager and File Manager with a vivid, easy-to-navigate interface very similar to the Macintosh operating system.

In fact, File Organizer has file folders like the Mac; icons to represent programs, data files, printers and drives like the Mac — it even has a trash can like the Mac. It makes everything you do fast, easy and fun — the clumsy File Manager and Program Manager are replaced with one, single (and beautiful) interface!

BatchWorks

Only BatchWorks can give you the powerful tools — harnessed in a simple-to-use format — to totally automate all the features contained within the Windows programs you're running. Why can't this be done in Windows? The answer is simple. The Windows environment simply isn't capable enough to handle it.

BatchWorks allows you to quickly and easily create keyboard macros that automate repeated tasks in the Windows 3.0 environment. You can assign macros as menu commands in any or all Windows applications. BatchWorks records macros and batch files by learning keystrokes. It's easy and it saves time.

The BatchWorks scripting language provides a robust collection of easy-to-access commands that can help you develop complex automation applications in just a few minutes.

PUBTECH®

PubTech

CQ5410 **File Organizer** **$199.00**
CQ5420 **BatchWorks** **$99.00**
Dual Media. *Require Windows 3.0 and 640K.*

Corel Draw! + NEC CD = Picture Power!

Corel Draw! on CD?

That's right. Now you can get the world's best drawing program on CD. Pop in this CD and discover a truckload of exciting and powerful graphics tools. You get over 150 typefaces, over 3000 symbols and designs, a free Pantone® color license, a free copy of CorelTRACE, and more.

In addition to all the fabulous features of Corel Draw! 2.0, you get over 3500 *extra* professional, color clipart images! Not just your average clipart, this is from ArtRight — a leader in the art business. PC Mag recently awarded ArtRight their Editor's Choice Award after reviewing lots of clipart (including Arts & Letters).

This same clipart alone (without Corel Draw!) is still sold on diskette for $1192 and takes up 43 diskettes. But you can have it on a single CD for a fraction of the cost. And as a bonus — your CD clipart is not compressed, meaning it will load up to 10 times faster than the diskette version!

NEC CD Reader

Why settle for an off-brand when you can have the best? The NEC CDR-36 is the latest release in a long line of proven CD Readers. Tried and true, this sleek new CD Reader will welcome you into the world of CDs. You'll soon fall in love with the vast amounts of information CDs place at your fingertips. Perhaps next you'll add an entire encyclopedia on a single CD to your library — or maybe all the phone books in the U.S. (Think about the mailing and telemarketing possibilities!)

COREL

Corel Draw! & CDR-36

CQ8635 **Corel Draw! CD-ROM & NEC CDR-36 Reader** **$999.00**
CQ8673 **Upgrade to NEC CDR-73** ... **Add $399.00**
CQ8630 **Corel Draw! CD-ROM only** **$595.00**
CQ5080 **Corel Draw! Disk Version** **$399.00**
Requires AT or above, hard disk, 640K, Windows 3.0, mouse.

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Razor-Sharp *262,144 Color* Hand Scanner!

Unmatched Resolution and Color that Fits in the Palm of Your Hand!

Imagine an instrument that you can quickly pass over a graphic image, logo, design, drawing, chart, photograph — and instantly capture it to your computer screen. Brilliant colors and unmatched resolution can be yours with the Marstek family of scanners.

The new M-6000CG Super Color scanner absorbs an astonishing 262,144 different colors from any printed page or photo! Scan in your photo albums, your wedding picture, or your graduation photo and display it onscreen with lifelike realism. Produce high-impact documents and presentations with the power of graphic images. The possibilities are limitless. The M-6000CG also scans in true 64 gray scales with 400 dpi. In color mode, the M-6000CG scans in 200 dpi. (200 dpi is just right for photos and artwork. Picture this: If you have a standard VGA monitor and scan in a 3" wide photo — it fills your entire screen with a perfectly duplicated image.)

For precise scanning of anything small, you need the M800 — delivering an incredible, unmatched 800 dots per inch. 800 dpi means crisper, cleaner, more highly detailed images for use in desktop published documents, reports, proposals, newsletters, flyers, and brochures. Scan in a postage stamp and it fills the screen with stunning detail.

And with a host of special effects and patterns built right in, controlling the look of the image is simple — and fun! The images you scan will reproduce as if they were originals, and they can be stored in TIF, PIX, PCX, CUT, IMG and MSP formats.

Or imagine simply scanning text from printed pages, magazines and books — no more re-keying!

The Marstek hand scanners deliver unmatched resolution for precise character recognition regardless of the type style or size and even include free optical character recognition (OCR) software to turn the scanned text into ASCII — ready to use in your word processing or desktop publishing application.

And the whole system is ready to run right out of the box. The installation is fast and easy, the technology is simply amazing.

The Marstek Family Of Mice.

The Marstek Mice are designed for higher performance. They're 100% Microsoft compatible and impeccably accurate — but they come with a surprisingly modest price tag. We tested the Marstek Mice (E22 and P93 models) for accuracy and speed against other leading nameplates, and it equalled or outperformed the Microsoft Mouse, Logitech's Series 9, and several others. The secret is in the outer shell design and durable construction. You'll notice a silkier movement and an increased feeling of control the very first time you use it. The Marstek E22 and P93 also feature buttons with firm, clean clicks. A far cry from the "mushy" buttons you find on other mice, great for fast, rapid-fire computing.

B O N U S !

Free When You Buy A Marstek Hand Scanner.

Marstek CAT Reader or Perceive Personal/ DOS OCR Software — These packages allow fast, easy optical character reading (OCR) for text pages. Imagine having the ability to simply SCAN text — instead of re-keying it! You'll improve efficiency for a variety of office tasks.

PC Paintbrush Plus or Rainbow Paint — the industry's most respected and capable paint programs — put the most extensive electronic palette at your fingertips — colors, image blending and more.

Marstek

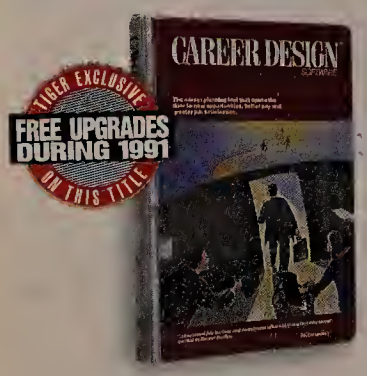
Marstek Scanner/Mice

CQ6150 M-6000CG w/Rainbow Paint and Perceive Personal/DOS OCR	$649.00
CQ6130 M-800 w/CAT Reader OCR and PC Paintbrush Plus	$279.00
CQ6120 M-800 w/CAT Reader OCR and PC Paintbrush Plus and E22 Mouse	$299.00
CQ6140 Marstek Mouse E22	$49.00
CQ6160 Marstek Mouse P93 w/PC Paintbrush Plus	$99.00
CQ6170 Mac 800 Scanner (for Macintosh) w/FREE Enhance Software	$399.00

Design The Perfect Career Move!

Turn Your Computer Into A Personal Career Advisor.

One of the hardest tasks any adult faces is looking for a new job. Whether you're just out of college, returning to the work force, laid off, fired or just looking for a new job, the whole situation is fraught with anxiety and stress.



Career Design will help you design the perfect career move. Using a multi-phase approach that focuses you in the right direction every step of the way, Career Design always gives you the help you need.

More than just a resume-writing program, Career Design gives you control of your career direction.

Discover Hidden Talents.

With Career Design, you'll get help answering the three important questions: "Who Am I?," "What Do I Want?," and "How Do I Get There?." These answers determine the direction you should go and Career Design helps you get there.

Career Design focuses you more clearly on what you want to accomplish with your life. Through a series of enjoyable and informative exercises you'll discover what your true interests and aspirations are.

When you're ready to write your resume, Career Design gives you 7 proven formulas to use, plus a powerful stand-alone word processor. There's even a section that lets you practice your answers to over 100 of the most commonly asked interview questions.

"I was dazzled by its thoroughness and ease of use. I would definitely recommend it to anyone who is even remotely considering a career move," says Joyce Lain Kennedy, careers columist, Los Angeles Times Syndicate.

Career Design
Software

Career Design

CQ3040-5 Career Design 5¼"	$79.95
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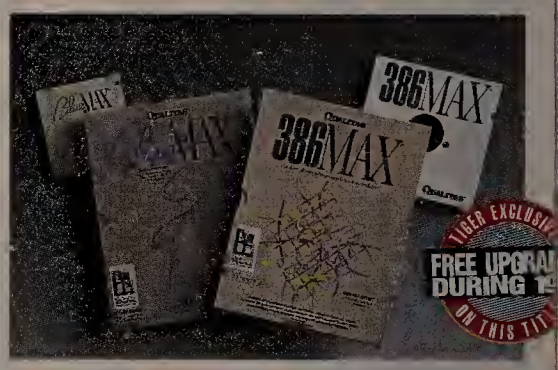
IBM PC, XT, AT, PS/1 or compatible with 525K of available RAM, 2.7 megabytes of hard disk space, & DOS 2.0 or higher.

A *Fully Automatic* Memory Manager.

30% Faster!



Congratulations! You own one of the hottest computers around. But do you use it the way you should? Do you take advantage of its incredible capabilities? Are you confused by all the types of memory, not knowing what program needs what kind of memory or how to provide it? Then 386MAX is your solution.

Speed Is the Key.

386MAX is the ultimate memory manager for today's 386 and 486 hi-tech computers. And best of all, hi-tech doesn't mean highly complicated. 386MAX automatically analyzes and configures your system for maximum performance and efficiency — from making utmost use of your extended memory — to providing Expanded Memory and/or XMS memory to programs that need it — to loading your pop-up utilities and network drivers between the 640K and 1MB area. And it's 30% faster than previous award-winning versions!

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With 386MAX your Windows applications get all the memory your system has to offer — *plus* any programs you run out of Windows (from DOS) get the Expanded Memory they need! You get the best of both worlds! You can even run pop-up utilities reliably in Windows — thanks to a special feature of 386MAX that allows many TSRs to appear more than once in multiple windows!

BlueMAX for the PS/2.

The *only* memory manager designed specifically for 386 PS/2 — BlueMAX does everything 386MAX does, plus uses proprietary technology to recover 80k more memory than any other memory manager.

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Any 386 or 486 based computer, minimum 256K extended memory, PC/MS DOS 3.0 or later. Supports LIM 4.0 EMS, XMS 2.0, VCPI and Virtual DMA Services 1.0.

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How Do You Fill In Pre-Printed Forms?

Eliminate One Of The Office's Most Time-Consuming, Tedious Tasks.

Are you still filling in insurance forms, legal and tax forms, government forms, invoices, medical and Federal Express forms by hand? Or struggling through the trial-and-error nightmare of using a typewriter? The fact is, filling in pre-printed forms is a classic example of inefficiency, with a high margin for error. The PC can be a great assistant in filling in forms, and FormFiller 3.0 is the premier forms fill-in software for even the most complex multi-page, multi-part, and double-sided forms.

FormFiller 3.0 actually synchronizes your computer printer (a critical first step), to locate blanks and place information on the form with pinpoint-precise accuracy, and it works with virtually any dot-matrix, daisywheel or laser printer.

This powerful software streamlines data entry with a host of on-screen guides and error-checking features. These features not only speed the process, but virtually eliminate errors as well — errors that can be very costly. Along with FormFiller 3.0's extensive data validation features there's plenty of fully context-sensitive help available for any function.

With FormFiller 3.0, you can decide the order in which the blanks should be filled in, give certain areas color codes for fast visual recognition, include non-printable notes to instruct data entry, "lock" certain information into the form so it won't have to be manually entered each time the form is filled out. You can also quickly set up FormFiller 3.0 to import and automatically fill-in forms directly from your database, and "batch print" your forms.

The system doesn't stop there. It contains a complete set of financial and mathematical functions that you can easily assign to particular blanks to perform a specific calculation whenever value is entered. Or you can automatically perform a series of calculations on a series of numbers. For example, you could quickly instruct FormFiller 3.0 to calculate the extended prices of all items listed on an invoice, total them, deduct a discount, figure and deduct taxes and calculate the final total. There are over 40 math functions in all, including amortization, interest, present and future values, depreciation, percentages — dozens of others!

There's more! FormFiller 3.0 includes a unique "Look-up" feature that stores pieces of information and automatically places them into position with just a menu selection. Part numbers, shipping and billing addresses, names, phone numbers, account numbers, payment terms and hundreds of other details can be organized and stored and retrieved anytime — without looking for them or retyping them. In addition, FormFiller 3.0 allows you to control exactly HOW the data is to appear and be printed. For example, negative numbers can be entered and automatically appear and print in parentheses. Enter a series of 10 digits into a specific field and FormFiller 3.0 displays them as an area code and telephone number, or make the data entered into certain spaces on the form automatically print bold.

This all means that a form that may have taken fifteen or twenty minutes to fully complete (possibly containing errors), now may require as little as one minute to fully complete, including a check for errors and omissions.

FormFiller 3.0 can, in fact, slash the fill-in time required for any form by as much as 80 percent. By

creating a "master template" of the form, FormFiller 3.0 can match any spacing, even if the spacing changes throughout the form or is inconsistent from blank to blank.

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FormFiller 3.0

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IBM PC, XT, AT, PS/2 or compatibles with 512K, DOS 2.0 or greater and one floppy drive and a hard disk. Supports virtually all printers. Includes "The FormFiller Sampler"— sample templates, user guide and help cards.

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Complete Atlas On Disk.

This innovative program brings the entire globe to your computer screen, combining a complete atlas, almanac and world fact book into one exciting, informative package. You'll have instant access to over 240 fully detailed, EGA/VGA color maps along with a vast database of useful international information. You'll explore the geography, people, government and economy of any nation on Earth, including such details as climates, population, language, labor force, military strength, industry, highways and more.

Indispensible Guide and Reference Tool.

World Atlas is an ideal reference tool for travelers, educators, business people, librarians and students. With just a couple of keystrokes any bit of data is on your screen.

You don't need to learn lengthy commands. Just point to a country on any index map, click — the desired map appears instantly. From there, simply select specific information and statistical maps for individual countries from sleek, drop-down menus. You can easily print customized reports mixing maps and text — even export maps to desktop publishing programs.

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U.S. Atlas brings the entire North American continent to your computer screen! Simply click on a state or city to explore such information as: population, average temperatures, and local time.

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Let's take a look at the individual components of the system:

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Houghton Mifflin's Abbreviation Program. Look up the proper abbreviation (or expansion) for hundreds of common and not-so-common terms.

The Written Word III — Principles of Grammar & Style. The prestigious publisher Houghton Mifflin provides this on-line reference book of grammar and style rules. Includes sample business letters and resumes, a proofreading guide and more.

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The Best-Selling Forms Software in the World!

Just Sit Down and Create a Great Form...

It's easy to see why FormTool is the best-selling forms package in the world. It's the fastest, easiest way to create, edit, manage and print custom, professional forms for immediate information gathering.

The ability to quickly gather data and put it to work is critical to corporate information flow. FormTool's "Intelligent Line Drawing" and its hardware compatibility make it an indispensable tool for businesses of any size. That's why FormTool has found a home in well over half of the Fortune 500 list, along with thousands of educational institutions, government agencies, hospitals and financial organizations around the world. They've discovered FormTool's productive power.

Unlike its competitors, FormTool doesn't require additional memory, a graphics card, color display, mouse or scanner. It runs beautifully on anything from an XT to a 486. FormTool now supports hundreds of dot-matrix, letter-quality, daisywheel, thermal as well as Hewlett-Packard printers, and new support for PostScript lasers.

Draw Forms Fast.

FormTool streamlines the PC's ability to draw forms. Lines of any weight, boxes of any size, grids of any complexity and more can be quickly drawn with just a few keystrokes. If a grid isn't quite right, one keystroke re-draws it to meet your exact specifications, then displays it on the screen with our WYSIWYG display. Zoom in to see a close-up of your form, then zoom out for the full page view. If you spot a problem, quickly make the revision, preview it again — then print it.

This preview capability combines the advantages of a graphics-based, on-screen display with text-based, lightning-fast processing times and makes FormTool even easier to use — and enhances creativity and accuracy in the design process.

Instant Revisions.

FormTool's ability to make instant revisions to your forms gives you the flexibility to create exactly the proper form to meet the requirements of your work flow. Ideal for users of any experience level.

Enter Text in Seconds.

To handle text, FormTool contains a forms-oriented word processor that allows you to move quickly through the form inserting captions, instructions, word-wrapped text and special symbols, and characters. FormTool will enter your text into position automatically.

An All New Forms Manager.

And FormTool Gold contains an all new Forms Manager that makes organizing, retrieving and archiving forms faster and more efficient.

Includes a built-in backup and restore, the ability to instantly view forms from a list on your screen and a new set of features that allow you to "move," "copy," or "delete" forms from the Forms Manager.

FormTool's Forms Manager also includes hard disk directory support, allowing you to store forms anywhere — or you can assemble form sets in just seconds using the sleek new menu system.

B O N U S !

FREE QUICK TEMPLATE When you buy FormTool Gold!

Quick Template is the perfect replacement for your lost plastic templates. Pop up a list of every special key from within FormTool Gold. *A $49.95 value!* ***See below for details.***

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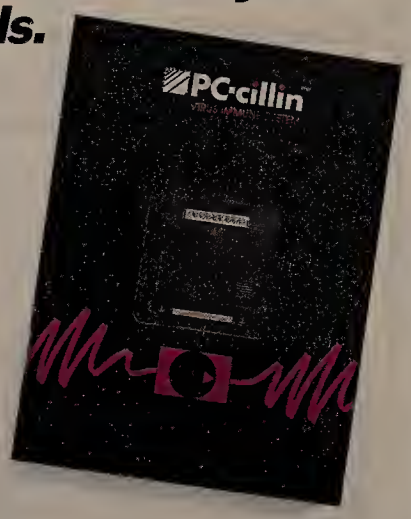
The Virus Protection Used by Law Enforcement Officials.

It Takes Software AND Hardware for Total Protection.

Viruses — if you're part of a LAN computer system, connect up to bulletin boards, or simply use floppy diskettes (who doesn't?), then you could be a victim. Don't be a statistic! Protect and immunize yourself with PC-cillin — the absolute best anti-viral system that protects like nothing else can. Here's why...



The Only Total Solution.

PC-cillin is the only anti-viral product that provides software and hardware protection against malicious viruses. Your computer's vital information is safely stored in the external memory of the PC-cillin Immunizer Box. The Immunizer Box plugs into your parallel port, between your computer and your printer, so it is totally isolated. It is impossible for a virus to get at it. If one of the 'new generation' intelligent viruses gets by all the other numerous traps, PC-cillin still has its reserved, totally isolated, external memory backup. PC-cillin also does a regular self-check to ensure it remains free from virus infection. If the self-check indicates an infection, a clean copy of the PC-cillin file is generated.

When PC-cillin detects an attempt to infect your software, it captures the offending code, protects all programs on your disk, and issues an on-screen warning with instructions.

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PC-cillin

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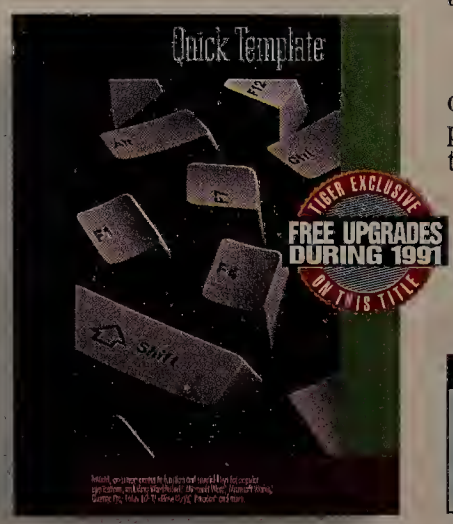
Special Key Labels At Your Fingertips — Where They Belong.

What does this key do again? Which key begins a Block? If you ever ask yourself questions like these — here's your answer. Quick Template tells what your Function Keys and Control keys do, from within your program. Whether it's WordPerfect, dBase, or a long list of others, Quick Template puts the help you need at your fingertips.

Quick Template is the perfect replacement for your lost plastic templates and even your manual. From WordPerfect — up pops a list of every special key in WordPerfect. New program — new list. Smart.



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CQ Y2624 Lotus 1-2-3 2.2 ..... $366
CQ Y2634 Lotus Magellan $108
CQ Y2644 Lotus Agenda 2.0 ..... $297

MECA
CQ Y2744 MECA Managing Your Money 7.0 ..... $146

MICROCOM
CQ Y2764 Microcom CarbonCopy Plus 5.2 ..... $122

MICROLYTICS
CQ Y2784 Microlytics GOfer 2.0 ..... $50

MICROSOFT
CQ Y2804 Microsoft Productivity Pack for Windows .. $49
CQ Y2814 Microsoft Windows 3.0 ..... $102
CQ Y2824 Microsoft Project for Windows $480
CQ Y2834 Microsoft Power Point for Windows $341
CQ Y2844 Microsoft Works 2.0 ..... $102
CQ Y2854 Microsoft Word 5.0 ..... $236
CQ Y2864 Microsoft Word for Windows $341
CQ Y2874 Microsoft Excel 2.1 ..... $341
CQ Y2884 Microsoft QuickBASIC 4.5 ..... $68
CQ Y2894 Microsoft QuickC 2.5 ..... $68
CQ Y2904 Microsoft C Compiler 6.0 ..... $341
CQ Y2914 Microsoft Flight Simulator 4.0 ..... $42
CQ Y2924 Microsoft Bookshelf $205
CQ Y2934 Microsoft Windows Entertainment Pack ... $33

MULTISOFT
CQ Y2944 Multisoft PC-Kwik Power Pak 1.5 ..... $79

NEC
CQ Y3024 NEC Multisync 2A $512
CQ Y3034 NEC Multisync 3D Monitor $707
CQ Y3044 NEC Multisync 4D Monitor $1,195
CQ Y3054 NEC Multisync 5D Monitor $2,495

ORCHID TECHNOLOGIES
CQ Y3074 Orchid Technologies ProDesigner VGA II 512k (1024X768) $303
CQ Y3084 Orchid Technologies Peanut VGA (256k) ... $125
CQ Y3094 Orchid Technologies ProDesigner/e (256k) . $212
CQ Y3104 Orchid Technologies Tiny Turbo XTRA $290

PLUS DEVELOPMENT
CQ Y3124 Plus Development HardCard II 40Meg (19ms) $428
CQ Y3134 Plus Development HardCard II 80Meg (19ms) $685

QUARTERDECK
CQ Y3154 Quarterdeck QRAM 1.0 ..... $53
CQ Y3164 Quarterdeck Expanded Mem. Mgr 386 5.1 . $69
CQ Y3174 Quarterdeck DESQView 386 5.1 ..... $144
CQ Y3184 Quarterdeck DESQView 2.3 ..... $86
CQ Y3194 Quarterdeck Manifest 1.0 ..... $39

REALITY TECHNOLOGIES
CQ Y3214 Reality Technologies WealthBuilder 1.1 .... $150

SOFTWARE PUBLISHING
CQ Y3234 Software Pub. Pfs: First Pub. 3.0 ..... $99
CQ Y3244 Software Pub. Pfs: First Choice 3.02 ..... $110
CQ Y3254 Software Pub. Harvard Graphics 2.3 ..... $355
CQ Y3264 Software Pub. First Choice Network 2.0 ... $330
CQ Y3274 Software Pub. First Graphics 1.0 ..... $101
CQ Y3284 Software Pub. Pfs: Preface 1.0 w/Viruscan . $49

SYMANTEC
CQ Y3304 Symantec Grandview 2.0 ..... $212
CQ Y3314 Symantec Q&A 3.0 ..... $237
CQ Y3324 Symantec Timeline 4.0 ..... $489
CQ Y3334 Symantec Northon Commander 3.0 ..... $105
CQ Y3344 Symantec The Norton Utilities 5.0 ..... $124
CQ Y3354 Symantec The North Backup 1.1 ..... $107

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CQ Y3424 The Complete PC The Complete Half Pg. Scanner 400 ..... $201
CQ Y3434 The Complete PC The Complete Page Scanner $599
CQ Y3444 The Complete PC The Complete Communicator $470
CQ Y3454 The Complete PC The Complete Fax 9600 ..... $425
CQ Y3464 The Complete PC The Complete Answering Machine $268
CQ Y3474 The Complete PC The Complete Flatbed Scanner ..... NEW $1031

TIMEWORKS
CQ Y3494 Timeworks Publish It! 1.2 ..... $150

TRAVELING SOFTWARE
CQ Y3514 Traveling Software Battery Watch 2.0 ..... $35
CQ Y3524 Traveling Software LapLink III 3.0 ..... $95

VIDEO 7
CQ Y3544 Video 7 Vega VGA (800X600) $154
CQ Y3554 Video 7 VRAM VGA 512k (1024X768) $387

WORDPERFECT CORP.
CQ Y3574 WordPerfect Corp. WordPerfect 5.1 ..... $273
CQ Y3584 WordPerfect Corp. DrawPerfect 1.1 ..... $297
CQ Y3594 WordPerfect Corp. Letter Perfect $147

WORDSTAR INTERNATIONAL
CQ Y3614 WordStar International WordStar Prof. 6.0 . $285

XTREE
CQ Y3634 XTree XTreePro Gold $99

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People's Choice: 20-MHz 386SXs

Never has so much computer cost so little. Discover the top values among ten new 20-MHz SX systems—and learn which companies back them with solid service and support.

Robert Lauriston

Fast, economical, and ready to run all the latest software, today's 20-MHz 386SX systems make it foolish to consider anything less capable. For only a couple of hundred bucks more than a similarly configured 16-MHz SX, you can get a machine that's likely to be a full 34 percent faster—a visible and welcome difference, especially if you're using *Microsoft Windows.*

What's more, most 20-MHz SXs are better able to keep up with software's ever-increasing hardware requirements than their 16-MHz cousins, thanks to more room for drives, expansion boards, and fast (CPU-speed) RAM. So with that extra power comes a system that will hold its value longer.

Everything's relative, of course. Compared to 25- or 33-MHz 386DXs, these SX machines are not particularly fast. You wouldn't want one for a file server or a heavy-duty graphics workstation—and multitasking four or five *Windows* applications can slow down an SX to the point of pain. But for most people, a 20-MHz SX has all the speed you'll need for a long time to come.

SXs on Parade

We looked at SX-20s only four months ago ("Value Alert! 20-MHz 386SX Systems," February 1991), but so many machines have come out since then that we had no trouble finding ten hot systems that weren't available the last time around. For a real-world comparison, we priced and speed-tested each system in an ample, *Windows*-ready configuration, which included at least 4MB of RAM, a 100MB or larger hard disk, and color VGA graphics. And since dealer discounts vary (and mail-order companies don't discount at all), we used *street prices,* not list prices, to compare these systems. *PC World* researchers obtained and averaged price quotes from 90 dealers in eight cities across the United States.

You'll want an SX system that's fast, can take plenty of fast RAM, and comes with strong service and support from the manufacturer, all at a reasonable price. Performance is particularly important since it varies greatly in this category; if you're not careful you could end up paying a 20-MHz price for a system that's not much faster than a 16. Our *PC World* performance tests simulate real-world applications, and at least one of them should fit your own work habits.

When *Windows* turns sluggish, you can usually feed it RAM chips to perk it up. But RAM installed on a conventional memory card will slow down an SX, so make sure your new system can accept plenty of RAM on the motherboard or in a special fast-RAM slot. A 16MB ceiling is none too high. For a detailed guide to SX

PHOTOGRAPHS BY MARC SIMON

buying issues, see "Buying Smart: SX Excellence."

Whether you're a novice or the office computer doctor, at some point you'll have to talk to someone who knows more than you do; you may even need him or her to come to your office. You should therefore demand prompt, knowledgeable telephone technical support—either local or toll-free—as well as an on-site repair option. With this review, *PC World* initiates tough new guidelines for grading the customer service and technical support you're likely to get from the companies that make these systems and the stores that are authorized to sell them (see "How We Rate Service and Support").

Which System Should You Buy?

Naturally, we compared the new kids on the block with the best of the last batch to see if any of the newcomers could beat the previous winners. Only the CompuAdd 320sc measures up to the two Best Buys from our February review—the Compaq Deskpro 386s/20 and the NCR PC386sx20. The Best Buy CompuAdd 320sc is faster than most, offers superb service, and comes with DOS and *Windows* already installed. The Zeos 386SX-20 comes close—it's faster, cheaper, and more expandable than any of the three Best Buys—but quality-control problems knock it out of the winners' circle.

The CompuAdd 320sc may be the only Best Buy this go-around, but there are several other good SX values. And that's good news for the smart PC buyer.

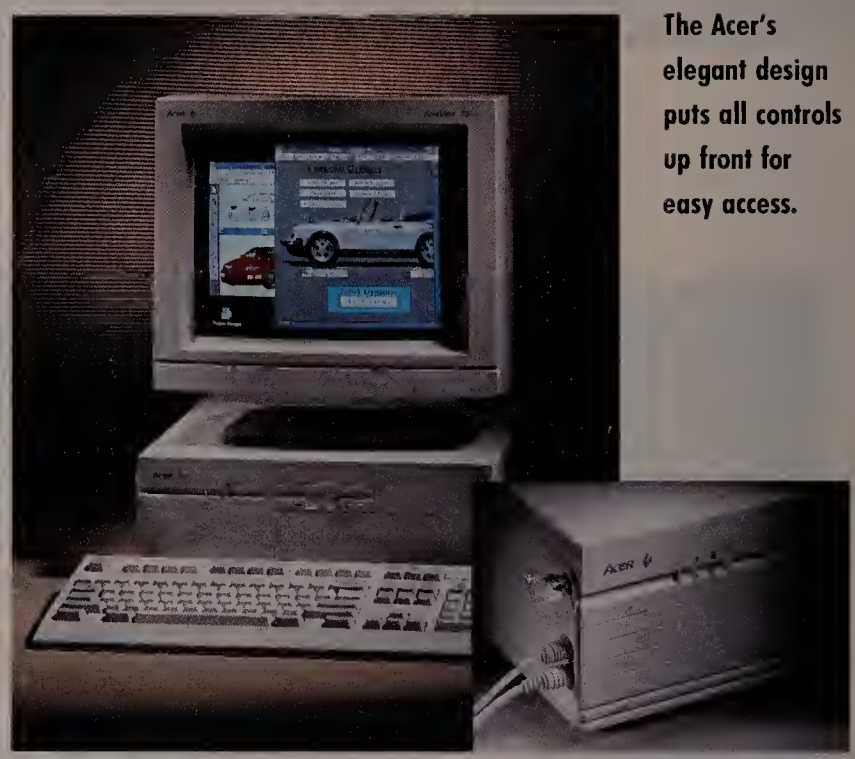
Robert Lauriston is a contributing editor for PC World. *Cathy Smith is a* PC World *editorial assistant.*

Acer 1120/SX

PROS: Low price, great ergonomics, good keyboard, two-year warranty **CONS:** 8MB fast-RAM limit, low drive capacity

Acer designed the 1120/SX with human beings in mind—human beings on a budget! At $2651, this is the second cheapest system in the roundup. Moreover, the system and monitor controls, as well as the keyboard and mouse jacks, are up front where you can reach them easily, and the keyboard has a crisp feel to it. You won't be able to put 5¼-inch floppy, 3½-inch floppy, and tape drives into the Acer, however; the 5¼-inch drive uses up two of the three front-access bays.

Acer's service and support are outstanding, with a toll-free number open 12 hours a day and a good two-year warranty. At times we had to wait for a technician, but never for more than 4 minutes. Despite its unexceptional performance, the 1120/SX is a good value.



The Acer's elegant design puts all controls up front for easy access.

Within the AGI's ample case are only three drive bays and four free slots.

AGI Model 3000B

PROS: Relatively fast
CONS: 8MB fast-RAM limit; poor ergonomics

The $2915 3000B is slightly faster and slightly cheaper than average, but not enough to set it apart from the crowd. It has many of the problems of a small-footprint machine—without the small footprint. To shave a mere 4 inches off the width of a standard AT case, AGI cut the usual five drive bays to three; that's enough for a LAN workstation but not for a stand-alone system. The keyboard feels mushy, and it's the only system reviewed that makes you use a screwdriver to adjust some common monitor controls.

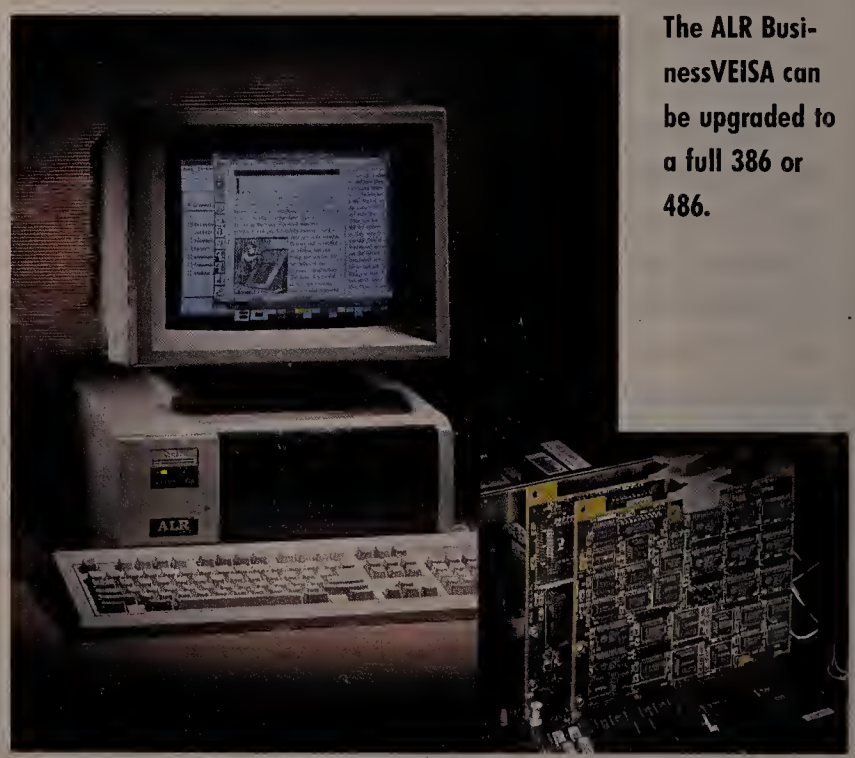
AGI—a new division of Everex—responded quickly to our service calls, which is a good thing since the number is a toll call. Like the service that comes with it, the 3000B is good but not great.

ALR BusinessVEISA 32CSX

PROS: CPU upgrade path, relatively fast
CONS: Expensive, mushy keyboard, poor construction

Thanks to a CPU upgrade option, you can't really outgrow the BusinessVEISA 32CSX, and that justifies its $4538 cost—the highest in the roundup. But don't be fooled: Until you upgrade to a 386DX or 486 CPU, you can't use the three 32-bit EISA slots for EISA boards. The CPU upgrade also raises the fast-RAM limit to 49MB.

The VEISA has its flaws: The power switch on our test unit didn't work right—a problem ALR says it has fixed in newer units. And we had to wait for up to 10 minutes for a technician to answer the central support line. Fortunately, your local dealer has access to a direct line. What do *you* have access to? A great upgrade path, and that makes the VEISA worth considering.



The ALR BusinessVEISA can be upgraded to a full 386 or 486.

Buying Smart: SX Excellence

So how do you pick which 20-MHz 386SX to buy? Do you run down to your local Park 'n' DOS and buy the cheapest SX/20 they sell? Or the one with the most colorful ads? Hey, at these prices, how can you lose?

An SX may be a low-cost computer, but you should still expect it to be fast, long lasting, and backed by solid support. This makes performance, fast-RAM capacity, and quality of service your key buying criteria.

PERFORMANCE

Performance varies widely from system to system and from one application to another. A computer may zip through *Windows*, for instance, only to slog through *1-2-3*. So it's important to check our Test Report to see how well a system did on the applications you use most often.

Although many factors, including video controller and hard disk speed, affect performance, a memory cache controller makes the biggest difference. A cache places a small amount of very fast—and very expensive—RAM between the CPU and the main memory. By keeping frequently used code in the cache as well as main memory, system performance is increased significantly: All the cache systems were faster than any of the cacheless systems. But don't let the size of the cache fool you. A small but well-designed cache will speed your system more than a large but poorly designed one.

FAST-RAM CAPACITY

Windows, *1-2-3*, *WordPerfect*, and *Paradox* all run faster with extra RAM, and your memory requirements are almost certain to go up—while the price of RAM is likely to go down.

For RAM to keep up with a 20-MHz CPU, it must be placed on the motherboard or on a special card in a proprietary fast-RAM slot; a standard-slot memory card intended for a 286 will only slow your system down. Since you can never install more fast RAM than a system was originally designed to hold, look for a computer that will let you upgrade to 16MB—the most the SX chip will support.

EXPANDABILITY

You'll need a way to install tape drives, fax cards, and whatever other accessories you may buy in the coming years. The more drive bays and expansion slots at your disposal, the greater your freedom to add functionality to your aging system.

You probably won't use an SX system as a network file server, so you don't need massive drive or board capacity. SXs make dandy network workstations, though, and in this mode—using the server's hard disks and peripherals—three drive bays and three free slots should be plenty. If you're planning to use your SX computer as a stand-alone, non-networked system, your needs are sure to increase. You'll want four bays (for two floppy drives, a tape backup, and a hard disk), and slots (for fax/modem boards, CD ROM drive controllers, network interface cards, high-capacity hard disk controllers, and so on).

DESIGN AND CONSTRUCTION

A computer workstation should be designed for your comfort, not the other way around. Look for easy-to-reach system and monitor controls, a sharp display, a quiet fan and hard drive, and a comfortable and responsive keyboard. Don't put too much emphasis on the keyboard, however—even if it is arguably the most ergonomically important part of the computer. You can, after all, buy an excellent replacement keyboard for less than $100.

Clever layout inside the case will make it easier to add or swap boards, drives, or RAM. A small footprint can save desk space, though even the smallest of these systems is only 2 inches shorter, front to back, than a standard AT case.

SERVICE AND SUPPORT

Whether you buy your system from a local dealer or order it direct from the manufacturer, you should demand and get top-quality service and support. With this issue, *PC World* introduces a new policy for judging the telephone-based technical support offered by system manufacturers and their authorized dealers. We tested the quality of vendors' centralized support by calling them and seeing for ourselves what sort of service they provide. Since we couldn't test local stores as closely, we scrutinized vendors' policies to make sure they were requiring their dealers to properly support you, and giving dealers what they need to do the job.

In addition to telephone support, you should demand at least a one-year warranty, but a longer term will save you money in case of trouble. And on-site service—through your dealer or a contracted service center—will save you a lot of that trouble. See "How We Rate Service and Support" for further details.

FEATURES EVALUATION

CompuAdd Design and Support Are Key to Success

With so many similar units vying for your SX dollar, benefits like support and design details give a standout like the CompuAdd 320sc the Best Buy edge.

● Yes
○ No
n/a =not applicable

	Acer 1120/SX	AGI Model 3000B	ALR Business VEISA 32CSX	CompuAdd 320sc	Mitac MPC-2386e	Tandon SL 320SX	Tandy 4020SX	Twinhead Superset 590/20	Wyse Decision 386sx/20	Zeos 386SX-20
Standard features										
Street price[1]	$2651	$2915[2]	$4538	$3158	$2895	$3007[3]	$4148[4]	$2435[5]	$3162	$2795[6]
List price	$3535	$3620[2]	$5672	$3158	$3630	$3007[3]	$4148[4]	$2988[5]	$4161	$2795[6]
80387SX coprocessor support	●	●	●	●	●	●	●	●	●	●
Mouse port	●	○	●	●	○	○	●	○	○	○
Setup utility in ROM	●	●	●	●	●	●	○	●	○	●
Fast-RAM capacity	8MB	8MB	16MB[7]	16MB[8]	8MB	5MB	5MB	5MB	8MB	16MB
Expandability										
8/16-bit slots/number free	4/4	6/4	5/3[9]	3/3	5/4	3/2	3/3	4/4	6/5	7/6
8-bit slots/number free	0/0	2/0	1/1	2/2	1/1	1/1	0/0	0/0	2/1	1/1
External/internal drive bays[10]	3[11]/1	3/0	3/1	2/2	3/1	2/1	3/0	3/1	3/1	4/3
Largest hard disk option	100MB	n/a[12]	1.2GB	200MB	200MB	200MB	440MB	300MB	110MB	1.1GB
Design and construction										
Compact footprint[13]	●	○	○	●	○	○	●	●	○	○
Front-panel on/off switch	●	○	●	●	●	●	●	●	○	●
Service and support										
Warranty period (months)	24	12	12	12	12	12	12	12	12	12[14]
On-site service available	●[15]	●[15]	●[15]	●[15]	●	●	●[15]	●	●[15]	●[15]
Vendor support										
Central support/toll-free	●/●	●/○	●/○	●/●	●/●	●/●	●/○	●/●	●/○	●/●
Daily support (hours)	12	11	10	11	10	24	8	12	8	24
Weekend support	○	○	○	●	○	●	○	○	○[15]	●
Electronic BBS	●	●	●	●	●	●	●	●	●	●
Vendor-to-dealer support										
Dedicated support staff required	○	○	○	●	○	○	●	○	○	n/a
Support staff training required	●[16]	●[16]	●[16]	●	●[16]	○	●	○	●	n/a
Dedicated support line for dealers	●	○	●	●	○	○	●	●	●	n/a
Inventory and parts requirement	●[16]	●[16]	●[16]	●	●	○	○	○	○	n/a
				BEST BUY						

[1] Except as noted, price based on 4MB RAM, 100MB or larger hard disk, 1.2MB 5¼-inch (or 1.44MB 3½-inch) floppy drive, VGA and color monitor, at least one parallel and two serial ports (or one serial and one mouse port), 101-key keyboard, mouse, and DOS 3.3 or later version. If the vendor doesn't offer a mouse, we added $99 to the street price and $125 to the list price to represent the cost of a basic Microsoft Mouse.

[2] Includes 160MB ESDI hard disk and controller.

[3] Includes 5MB RAM and 110MB IDE hard disk.

[4] Includes 5MB RAM and 105MB IDE hard disk.

[5] Includes 5MB RAM and 104MB IDE hard disk.

[6] Includes 130MB IDE hard disk, second floppy drive, and game port.

[7] Up to 16MB additional capacity for expanded memory. Total is 49MB if microprocessor is upgraded.

[8] Up to 16MB additional capacity for expanded memory.

[9] Three are 32-bit EISA slots; one ISA slot (two if fast-RAM expansion board is installed); can't hold a full-length board.

[10] Half-height, third-height, or 3½-inch bays. Except as noted, at least one externally-accessible bay is half-height 5¼-inch.

[11] All bays are 3½-inch; two joining 3½-inch bays can hold one 5¼-inch drive; other bay is third-height.

[12] Hard disks are sold and installed by dealer only.

[13] No more than 16 inches wide or deep.

[14] 60-month warranty on the keyboard.

[15] Extra-cost option.

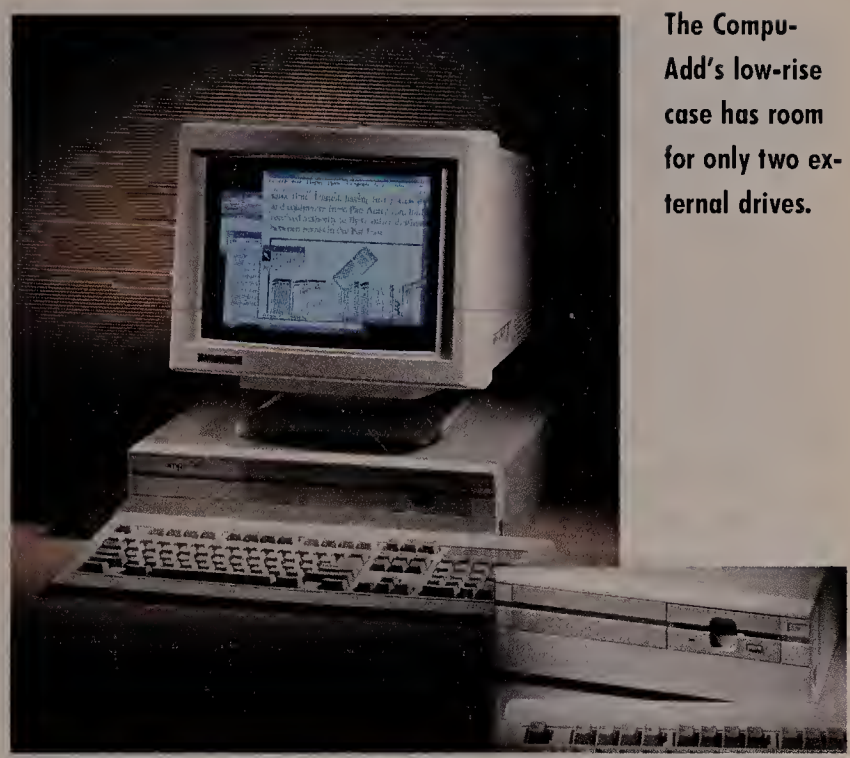
[16] Required of Authorized Service Centers; not a requirement of the dealer.

CompuAdd 320sc

PROS: Fast, great service, DOS and Windows already installed **CONS:** Mushy keyboard

If you want to be up and running yesterday, this Best Buy is for you. From step-by-step directions on the shipping box to the preinstalled copy of *Windows*, the $3158 CompuAdd 320sc is easy to set up. And if you do have a problem, you can expect first-rate service and support from any of the 91 CompuAdd stores across the country.

The 320sc also proved a good performer, rating second in this roundup and even beating the Compaq (one of February's Best Buys) in the *1-2-3* test. But forget about getting two floppy drives and a tape drive into this system at the same time; only two of the four bays have front access. Still, if you think easy setup is more important than limitless drive bays, the 320sc is your Best Buy.



The CompuAdd's low-rise case has room for only two external drives.

The Mitac is a sturdy machine at a reasonable price, but it's sluggish.

Mitac MPC-2386e

PROS: Prompt service, good keyboard
CONS: Very slow, 8MB fast-RAM limit

If you're going to use a Mitac MPC-2386e, be prepared to wait. This $2895 creeper came in last in the important *1-2-3* test, and second to last in most of the others. It wasn't on average the slowest computer in the roundup—but it was close. And you'll find that upgrading it is no picnic. Before you can add RAM, for instance, you have to expose the motherboard's memory sockets, and that involves partially dismantling the system.

If it weren't for the short hours, Mitac's service and central tech support would shine. One year of on-site service is included in the price, and we got very prompt responses to our questions on its toll-free support line. But fast service doesn't make up for slow performance.

Tandon SL 320SX

PROS: Terrific service
CONS: 5MB fast-RAM ceiling, few drive bays, slow

The best description for the $3007 Tandon SL 320SX is "claustrophobic." The 5MB fast-RAM ceiling will soon seem cramped and the case already seems cramped. The chassis is almost as big as an AT's, and you will find only three bays; two of them are front-loading and the other is difficult to install a drive in. The Tandon placed near the bottom in our benchmarks, coming in last in the *Paradox* test.

On the bright side, Tandon's service policies are tops. If you start seeing ominous error messages at 3 a.m., a technician is waiting at an 800 number. We also tried during business hours (when the wait is longer), and we always got through right away. If the SL 320SX were as fast, or as impressive, as Tandon's support, we'd recommend that you buy it.

Installing a hard drive in the Tandon requires skill and dexterity.

How We Rate Service and Support

Cathy Smith

Vendors may boast about size, speed, and enormous upgrade capacity, but when your computer isn't working properly, those words are meaningless. If you can't get competent help right away, your work won't get done on time.

How does *PC World* rate service and support? To receive an Excellent rating, a system must come with a one-year warranty and an on-site service option. A vendor must offer either prompt, central, toll-free, 12-hour-a-day telephone support or require that dealers offer phone support via trained personnel. In the latter case, the vendor must provide the training and have a dedicated phone line for dealer tech support.

High-quality telephone support is the keystone of a good service policy—whether it comes from the vendor or your local computer store. You're unlikely to get excellent support from both of these sources, but you should demand it of at least one. Since you can't solve all your problems over the telephone, having a repairperson nearby—preferably one who makes housecalls—is your next priority.

Quick access to a technician is the most important element of good central telephone support, followed by a toll-free number and—if you work late nights or weekends—long support hours. Without identifying ourselves, *PC World* called technical support phone lines morning, noon, and night, asking about hard disks crashing, upgrades ruining the system, and the location of that elusive "any key." We found out which vendors answered their phones right away and which ones let you sample local radio stations for 15 minutes.

Unfortunately, surveying authorized dealers in a similar fashion is beyond our means. We can't call your local store, but we can find out which vendors are taking the necessary steps to ensure their authorized dealers will support you properly. We learned which vendors require their dealers to keep full-time support technicians on the payroll, and which vendors offer (and require) training for their dealers' support staffs. We also found out which vendors have a direct technical support line for dealers.

If something goes wrong with your PC, you'll want on-site service—a repair specialist who comes to you. If a vendor doesn't require dealers or service centers to provide on-site service options, buy elsewhere. If possible, look for a vendor that requires its dealers or centers to keep replacement parts in stock.

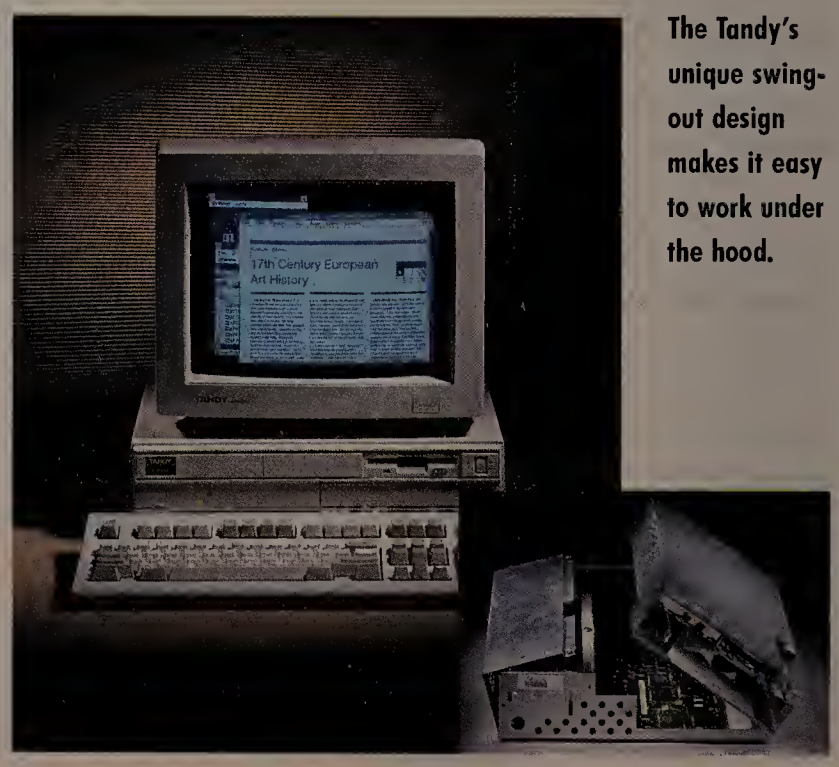
PC World can't really judge the quality of your local dealer, but you can. Find out if the store has dedicated support people on staff and whether they make house calls. Ask your salesperson a highly technical question and see if he or she can answer it. Ask other users about their experiences. And if you like a dealer, establish a relationship; regular customers always get the best service.

Tandy 4020SX

PROS: Clever fold-out design, small footprint
CONS: Limited fast-RAM capacity, expensive

The 4020SX has the same major flaw as the Tandon: a stingy 5MB fast-RAM ceiling that you're likely to hit before you know it. But at least the 4020SX is well designed: It's the smallest machine in the roundup yet one of the easiest to upgrade. Once you remove two screws, pop the cover, and fold the hard drive bays out on their hinges, you've got unhampered access to every component in the system. If you're on a network, you'll find the three bays (all front loading) and three slots acceptable—but they're tight if you stand alone.

Every Radio Shack Computer Center in the country has a trained technician ready to answer your questions and repair your system. But great support isn't enough to justify the 4020's steep $4148 price tag and low RAM capacity.

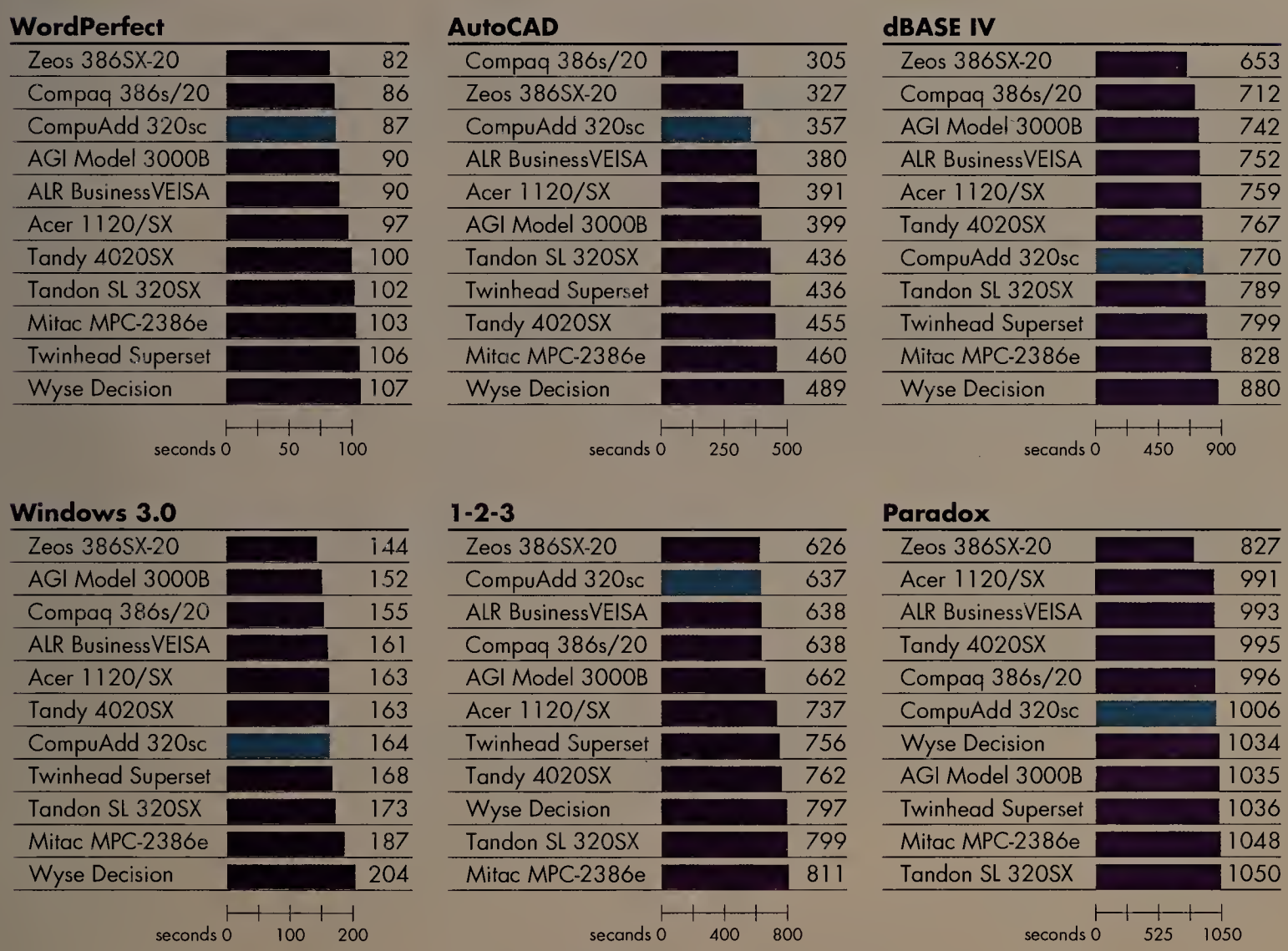


The Tandy's unique swing-out design makes it easy to work under the hood.

Zeos Speed Unsurpassed

The Zeos 386SX-20 leads the pack, coming in first in five out of six tests, with Best Buy CompuAdd 320sc on its coattails. One of the two Best Buys from our February roundup, the Compaq Deskpro 386s/20, is among the top contenders.

Best Buy



Methodology
We tested all the computers with 4MB RAM except the Tandon and the Twinhead, which had 5MB RAM. We used the vendor's version of DOS, and the systems had the following sizes of hard disk: Acer, Mitac, NCR 100MB; Twinhead 104MB; Tandy 105MB; ALR 106MB; CompuAdd, Tandon, Wyse 110MB; Compaq 120MB; Zeos 130MB; AGI 160MB.

WordPerfect
We reformat three *WordPerfect 5.1* documents that vary in size from 5K to 55K. The files are basic text with some boldface and underlined text; one of the documents includes a TIFF image.

dBASE IV 1.1
With the caching feature enabled, we complete an unindexed search for a single record in a 100,000-record parts table. Then we index the table, run the transaction processing module, and post 600 records.

1-2-3
In the *1-2-3 2.2* test, we complete the following operations: First, we load the application, followed by three separate worksheets (arithmetic, financial, and scientific). We make various changes and run recalcs on each. Finally we use the *MAPS* add-in from Management Advisory Services of Seattle to run a number of financial forecasts.

AutoCAD
We use *AutoCAD* release 10 to load a 500K drawing. We then mask layers, change zooms, and remove the hidden lines.

Windows 3.0
Timing begins and ends at the DOS prompt. We launch *Windows* along with a macro that loads *Microsoft Excel* with a financial worksheet and initiates a recalc. Then the macro loads Samna's *Ami Professional* along with a 50K document, in which is placed a 500K TIFF image. Finally, the macro launches *Micrografx Designer*, opens a drawing, displays it on screen, and exits to DOS.

Paradox
Starting with an orders table, we compare each record with an available stock table. The application finds the current price for the items and inserts the resulting record into an invoice table.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

dFacts Are In.

DATABASE COMPARISON TABLE	dBASE IV version 1.1	Paradox version 3.5	FoxPro version 1.02
EASE OF USE			
Control Center organizes data, queries, forms, reports, labels, applications on one screen	Yes	No	No
Create applications *without programming*	Yes	Yes	No
Modem pulldown menus for all Design Tools	Yes	No	Limited
Query by Example (QBE) for easy access to information	Yes	Yes	No
Context specific help by menu item	Yes	No	No
PRODUCTIVITY			
Quick Layout for automatic forms, reports and labels	Yes	No	Yes
Application Generator for quick application development	Yes	Yes	No
Automatic code generation for all Design Tools	Yes	No	No
Automatic maintenance of multiple indexes for ordering data	Yes	No	No
Memo fields for notes, letters, descriptions	Yes	No	Yes
POWER & FLEXIBILITY			
Bold, underline, italic, subscript, superscript text for high impact reports and labels	Yes	No	No
User Defined Functions for extending programming language	Yes	No	Yes
Data input validity checking in forms	Yes	Yes	Yes
Multi-user transaction processing ensures data integrity	Yes	No	No
Number of file formats imported/exported	7	6	3
INDUSTRY STANDARDS			
#1 Selling, #1 Rated multiuser database; over 3 million users (1)(2)	Yes	No	No
Compatible with dBASE III PLUS data and applications	Yes	No	Yes
Compatible versions for DOS, VAX VMS, Macintosh, SunOS and other UNIX platforms (3)	Yes	No	Limited
Structured Query Language (SQL) integrated with programming language	Yes	No	No

(1) dBASE III PLUS and dBASE IV comprise approximately 55% of PC database systems sold (3 times nearest competitor) according to the most recent report by the market research firm Audits & Surveys (Oct. 1990) (2) Software Digest rated dBASE IV #1 among multiuser databases, October 1990 (3) Versions of dBASE IV are shipping for DOS, VAX, and SunOS. Macintosh and other UNIX Platforms are announced.

Based on what our customers tell us, we made a list of some of the most important features to look for in data management software.

Then we compared the new dBASE IV® version 1.1 with two other database products.

As you can see, dBASE IV offers exclusive advantages in many categories.

For instance, only dBASE IV lets you access all its functions from a single screen. Called the Control Center, this screen lets you manage existing data, and create new tables, queries, reports, forms and labels totally without programming.

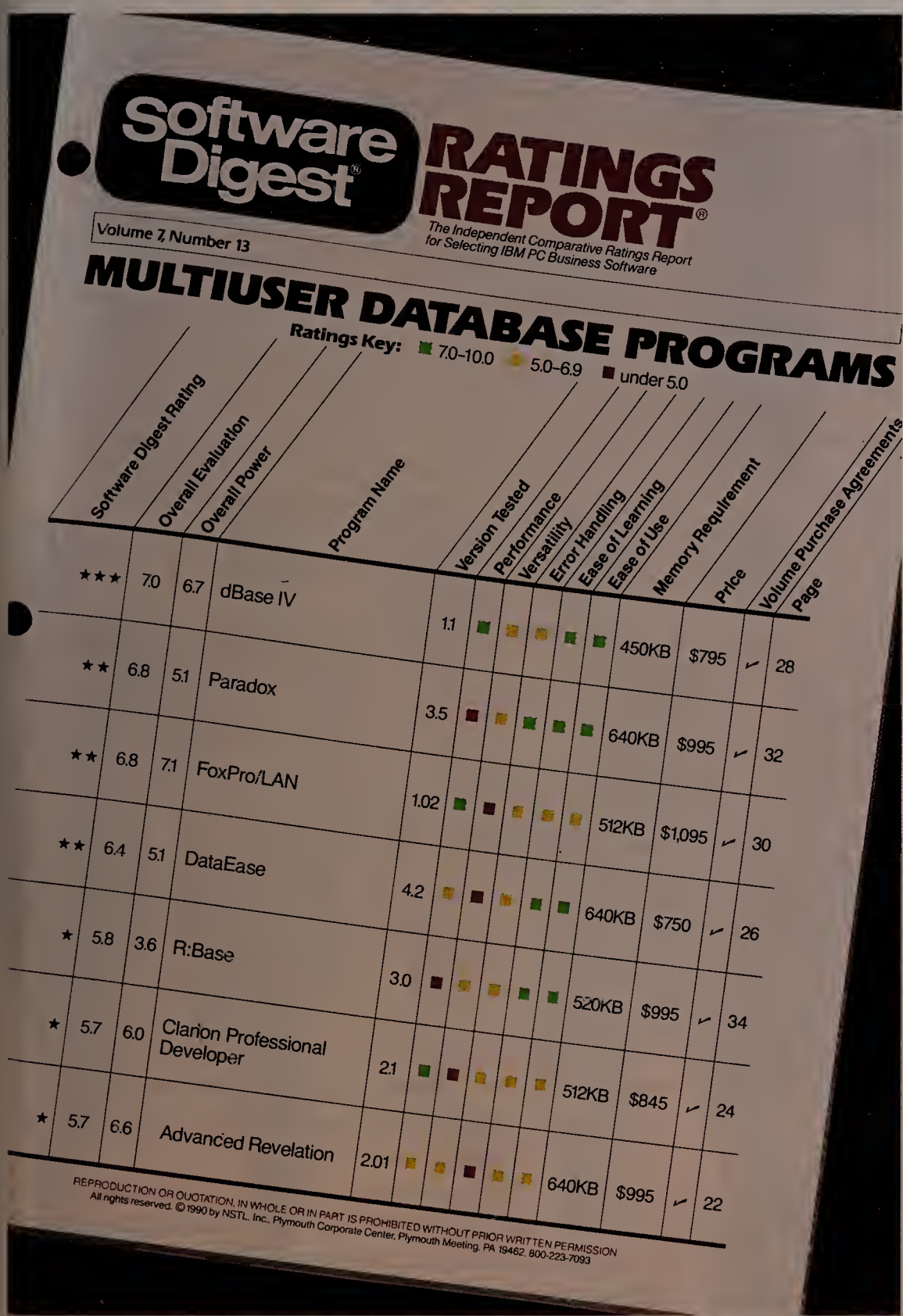
When all the facts are on the table, it's easy to see which database software is best.

Of course we aren't the only ones who have come to this particular conclusion.

Software Digest rates dBASE IV version 1.1 the #1 Multiuser Database (Vol. 7, No. 13, Oct. '90).

Trademark/owner: dBASE IV, Ashton-Tate, Ashton-Tate logo/Ashton-Tate Corp. Other company or product names mentioned may be

dTruth Comes Out.



Software Digest® RATINGS REPORT®

The Independent Comparative Ratings Report for Selecting IBM PC Business Software

Volume 7, Number 13

MULTIUSER DATABASE PROGRAMS

Ratings Key: ■ 7.0–10.0 ■ 5.0–6.9 ■ under 5.0

Software Digest Rating	Overall Evaluation	Overall Power	Program Name	Version Tested	Performance	Versatility	Error Handling	Ease of Learning	Ease of Use	Memory Requirement	Price	Volume Purchase Agreements	Page
★★★	7.0	6.7	dBase IV	1.1	■	■	■	■	■	450KB	$795	✓	28
★★	6.8	5.1	Paradox	3.5	■	■	■	■	■	640KB	$995	✓	32
★★	6.8	7.1	FoxPro/LAN	1.02	■	■	■	■	■	512KB	$1,095	✓	30
★★	6.4	5.1	DataEase	4.2	■	■	■	■	■	640KB	$750	✓	26
★	5.8	3.6	R:Base	3.0	■	■	■	■	■	520KB	$995	✓	34
★	5.7	6.0	Clarion Professional Developer	2.1	■	■	■	■	■	512KB	$845	✓	24
★	5.7	6.6	Advanced Revelation	2.01	■	■	■	■	■	640KB	$995	✓	22

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Perhaps the most independent publication in the industry, *Software Digest* accepts no advertising whatsoever. Corporations pay hundreds of dollars a year to receive their monthly reviews—which are considered highly unbiased and objective. Their exhaustive, 75-page report concludes:

"Among the top ranking programs, dBASE IV (version 1.1) is the most well-rounded, with solid performance, versatility, and usability." Commenting on speed, *Software Digest* points out that "dBASE IV produces all three test reports as fast as or faster than FoxPro/LAN." As for Ease of Use and Ease of Learning, dBASE IV scored in the Excellent Range as many times as any other multiuser database product tested.

For a free evaluation kit, including competitive details and a free demo disk, call toll-free: 1-800-437-4329 ext. 1416. Better yet, call 1-800-2ASHTON to upgrade to the new dBASE IV now.

The truth is, no other database can do so much to improve productivity.

Ashton-Tate®

trademarks of their respective companies. © 1991 Ashton-Tate Corporation. All Rights Reserved. GTSI's GSA Schedule #: GS00K90AGS5216, or call 1-703-631-1177.

Circle 15 on reader service card

EXECUTIVE SUMMARY

CompuAdd Speed and Support Add Up to a Best Buy

Only one of this new batch of SX/20s measures up to February's leading contenders.

For low-cost, entry-level systems, nothing beats 20-MHz SXs for 386-specific software compatibility and price/performance ratio. The best of these SXs are fast and able to hold up to 16MB of CPU-speed RAM. The **CompuAdd 320sc** joins two Best Buys from our February roundup: Compaq's Deskpro 386s/20 and NCR's PC386sx20. While the speedy **Zeos 386SX-20** beats all comers in performance tests, compatibility problems suggest poor quality control.

	Acer 1120/SX	AGI Model 3000B	ALR Business-VEISA 32CSX	CompuAdd 320sc	Mitac MPC-2386e	Tandon SL 320SX	Tandy 4020SX	Twinhead Superset 590/20	Wyse Decision 386sx/20	Zeos 386SX-20
Performance	Fair	Good	Good	Good	Poor	Fair	Fair	Fair	Poor	Excellent
CPU-speed RAM	Good	Good	Excellent	Excellent	Good	Fair	Fair	Fair	Good	Excellent
Expandability	Good	Good	Excellent	Good	Good	Fair	Good	Excellent	Good	Excellent
Design and construction	Excellent	Fair	Fair	Excellent	Fair	Fair	Excellent	Fair	Fair	Poor
Service and support	Excellent	Good	Good	Excellent	Good	Excellent	Excellent	Excellent	Good	Good
Price	Excellent	Good	Poor	Good	Good	Good	Poor	Excellent	Good	Good
Overall value	Good	Good	Good	Excellent	Fair	Fair	Fair	Good	Fair	Good
				BEST BUY						
Reader service no.	622	623	624	625	626	627	628	629	630	631

How we rate 20-MHz 386SX systems
We rate these systems based on information in the Features Evaluation and the Test Report, combined with our opinions of quality and reliability.

Performance is derived from standard-deviation analysis of benchmark results, giving extra weight to the *WordPerfect*, *1-2-3*, and *Windows* tests.

CPU-speed RAM refers to the amount of RAM that is available to the CPU without wait states. To win an Excellent, a system must accept 16MB.

Expandability covers the number and type of free slots and drive bays available. An Excellent rating requires four open slots, four drive bays, and a total of 300MB of hard disk storage.

Design and construction considers the footprint, manufacture, keyboard, monitor, compatibility, controls, and ease of working inside. An Excellent rating requires quality of most of these features and freedom from major design flaws.

Service and support rates the quality of technical support and repair service (see "How We Rate Service and Support").

Price ratings are calculated using standard deviation from the average street price, determined from our survey of 90 dealers in eight U.S. cities.

Overall value is averaged from all of the above criteria, with special emphasis placed on performance, CPU-speed RAM, and service and support.

Installing a disk drive in the Twinhead is a major challenge.

Twinhead Superset 590/20

PROS: Very low price, excellent service, good keyboard
CONS: 5MB fast-RAM capacity, slow

If money's tight and top performance isn't important, the Superset 590/20 is a good choice. Although it's slow and sticks you with a 5MB RAM limit, its virtues make it worth considering for light work. At $2435, the 590/20 is the least expensive SX in the roundup. And Twinhead's excellent support is second only to Tandon's.

Considering the manual—the only one to come without an index—first-rate support is important. Twinhead's toll-free number is open 12 hours a day, and we never called without getting a technician immediately. Technically speaking, the Twinhead is not a great machine, but when you add it up, the top-notch service and rock-bottom price make it worth considering.

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Surveying the Field: 20-MHz SX Systems

In this article, we've examined ten of the latest and most interesting 20-MHz SX systems—a fraction of the units shipping at press time. The table below gives you a broader view of the field. Six of the 20 listed were reviewed in our February issue; Compaq's Deskpro 386s/20 and NCR's PC386sx20 won Best Buys.

	List price[1]	Fast-RAM capacity	8/16-bit slots/ number free	8-bit slots/ number free	Drive bays[2]	Compact footprint[3]	Warranty (months)	On-site service
*ALR PowerFlex 20CSX	$4298[4]	5MB	5/4[5]	1/1	4	N	12	Y[6]
Arche Triumph 386SX/20	$3769	16MB	4/4	1/1	4	Y	24	Y[7]
*AST Premium II 386SX/20	$3770[8]	16MB	2/2[9]	1/1	5	N	12	Y[7]
AT&T 6386SX/EL20 WGS	$5400	20MB	3/3	0/0	3	N	12	Y[7]
Austin 386SX/20	$2568[10]	8MB	6/5	1/1	4	Y	12	Y
*Compaq Deskpro 386s/20	$7316[10]	16MB	4/4	0/0	5	Y	12	Y[7]
*Dell 320LX	$3378	8MB	6/5	2/2	5	N	12	Y
Eltech Model 2200	$2499	8MB	6/6	2/2	5	N	12	Y
Epson Equity 386SX/20	$4691	14MB	3/2	1/1	3	N	12	Y[7]
Everex Step 386SX/20	$4185	16MB	6/5	2/2	4	Y[11]	12	Y
FastMicro FastData SX/20	$1979	8MB	6/4	2/2	5	Y	12	Y
Gateway 2000 386SX/20 Coche	$2020[12]	16MB	5/5	0/0	3	N	12	Y[13]
Grid 386isx-20	$5028[14]	16MB	5/3	0/0	4	N	12	Y[6]
Hyundai Super-386STc	$3848	16MB	4/3	1/1	3	Y	18	Y[6]
Leading Edge D3/SX20c	$3874[15]	8MB	4/4	0/0	4	Y	20[16]	Y[16]
*NCR PC386sx20	$5744	16MB	4/4	0/0	4	N	12	Y[6]
*NEC PowerMate SX/20	$4946	12MB	4/3	0/0	3	N	12	Y[7]
Northgate SlimLine 386/SX 20	$2999[17]	8MB	3/3	2/2	3	N	12[18]	Y
Packard Bell Legend 520SX	$4199[19]	16MB	3/3	1/1	4	N	12	Y
Zenith Data Systems 386SX/20	$4997	8MB	6/4	0/0	2	Y	12	Y[7]

*Reviewed in February 1991.
[1] Except as noted, price based on 4MB RAM, 100MB or larger hard disk, 1.2MB (or 1.44MB 3½-inch) floppy drive, VGA and color VGA monitor, at least one parallel and two serial ports or one serial port and one mouse port, 101-key keyboard, mouse, and DOS 3.3 or later version. If the vendor doesn't offer a mouse, we added $99 to the street price and $125 to the list price.
[2] Half-height, third-height, or 3½-inch bays. Except as noted, at least one externally accessible bay is half-height 5¼-inch.
[3] No more than 16 inches wide or deep.
[4] Includes 5MB RAM and 800-by-600 VGA.
[5] One slot is slightly too short to hold a full-length card.
[6] Extra-cost option.
[7] Available through dealer.
[8] Includes 80MB hard disk.
[9] System also includes two free 8/16/32-bit slots.
[10] Includes 120MB–125MB hard drive.
[11] Also available with a larger footprint and an additional drive bay.
[12] Includes 120MB hard disk, extra serial port, and Windows 3.0.
[13] Free within 100 miles of a TRW service center.
[14] Includes 5MB RAM, 800-by-600 VGA and monitor, one extra parallel and one extra serial port.
[15] Includes both 1.2MB and 1.44MB floppies.
[16] End user can choose a 6-month on-site service warranty or 20-month parts-and-labor warranty.
[17] Includes 1.2MB and 1.44MB floppies and Windows 3.0.
[18] Five years for the keyboard.
[19] Includes 125MB hard disk, 1.2MB and 1.44MB floppies, and internal 2400-bps fax-modem.

WHERE TO BUY

Advanced Logic Research, Inc.
9401 Jeronimo
Irvine, CA 92718
800/444-4257
Reader service no. 770

Arche Technologies
48881 Kato Rd.
Fremont, CA 94539
800/422-4674
Reader service no. 771

AST Research Inc.
16215 Alton Pkwy.
Irvine, CA 92713-9658
714/727-4141
Reader service no. 772

AT&T
One Speedwell Ave.
Morristown, NJ 07920
800/247-1212
Reader service no. 773

Austin Computer
10300 Metric Blvd.
Austin, TX 78578
800/752-1577
Reader service no. 774

Compaq Computer
20555 State Hwy. 249
P.O. Box 692000
Houston, TX 77269-2000
800/231-0900
Reader service no. 775

Dell Computer Corp.
9505 Arboretum Blvd.
Austin, TX 78759-7299
800/426-5150
Reader service no. 776

Eltech Research Corp.
47266 Benicia St.
Fremont, CA 94538
415/438-0990
Reader service no. 777

Epson America
20770 Madrona Ave.
Torrance, CA 90503
213/782-0770
Reader service no. 778

Everex Systems, Inc.
48431 Milmont Dr.
Fremont, CA 94538
800/821-0806
Reader service no. 779

FastMicro
3655 E. La Salle St.
Phoenix, AZ 85040
800/441-3278
Reader service no. 780

Gateway 2000
610 Gateway Dr.
North Sioux City, SD 57049
800/523-2000
Reader service no. 781

Grid Systems Corp.
47211 Lakeview Blvd.
Fremont, CA 94538
415/656-4700
Reader service no. 782

Hyundai Electronics America
166 Baypointe Pkwy.
San Jose, CA 95134
800/727-6972
Reader service no. 783

Leading Edge
117 Flanders Rd.
Westborough, MA 01581
800/874-3340
Reader service no. 784

NCR Corp.
Workstation Products Div.
1601 S. Main St. PCD-1
Dayton, OH 45479
800/544-3333
Reader service no. 785

NEC Technologies
1414 Massachusetts Ave.
Boxborough, MA 01719
800/632-4636,
800/343-4418
Massachusetts and Canada
Reader service no. 786

Northgate Computer Systems
7075 Flying Cloud Dr.
Eden Prairie, MN 55344
800/548-1993
Reader service no. 787

Packard Bell
9425 Canoga Ave.
Chatsworth, CA 91311
818/773-4400
Reader service no. 788

Zenith Data Systems
2150 E. Lake Cook Rd.
Buffalo Grove, IL 60089
800/553-0331
Reader service no. 789

For more information about all products in this sidebar, circle reader service no. 912.

Wyse Decision 386sx/20

PROS: Prompt telephone support
CONS: Very slow, strange keyboard layout

Performance hounds be warned: The Wyse Decision 386sx/20 is the slowest machine in the roundup, coming in last in four out of six tests. Compared to this, even the Mitac's performance looks good. Slow speed aside, there's little to say about the $3162 386sx/20; its fast RAM, drive, and board capacities are adequate but unexceptional. One odd detail: The keyboard is laid out with a narrow <Alt> key, a double-width <Ctrl> key, and a <Select> key that, according to the manual, "has no function." Come again?

Wyse offers both vendor and dealer-based support, but the central line is a toll call, and dealers aren't required to keep a technician on staff. All things considered, the Wyse Decision is not a smart buy.

The Wyse provides ample room to expand, but it's the slowest SX in the roundup.

The Zeos's clever design leaves lots of room for drives and boards.

Zeos 386SX-20

PROS: Very fast, plenty of drive and board room, money-back guarantee **CONS:** Quality-control problems

The $2795 386SX-20 is the fastest, most expandable SX in the roundup. It would have rated a Best Buy if we hadn't encountered some problems testing it. The first 386SX-20 we tested couldn't load *1-2-3* release 3, and the second corrupted dBASE data files—an inconsistency that suggests quality-control rather than compatibility problems. During the one-year warranty period, Zeos will replace a defective part or system within 24 hours.

Zeos's phone support is open around the clock, seven days a week. Rather than keeping us on hold, they took our number and called us back between 14 and 35 minutes later. The Zeos's blazing speed and reasonable price make it a good buy. Just be prepared to make use of Zeos's warranty.

WHERE TO BUY

Acer 1120/SX
Acer America Corp.
401 Charcot Ave.
San Jose, CA 95131
800/733-2237,
408/922-0176 (fax)
LIST PRICE: with 2MB RAM; 1.44MB floppy; IDE; one parallel, two serial, one mouse port; 101-key keyboard; 800 by 600 VGA; DOS 3.3; Windows 3.0 $1995. With 3MB RAM, 40MB IDE hard disk, mouse $2549
ACCESSORIES: 1MB RAM $110, 4MB RAM $390; 100MB IDE hard disk $875; 1.2MB floppy $117; 14-inch VGA color display $445, DOS 4.01 $150
WARRANTY: two years
EXTENDED WARRANTY: through dealer
SUPPORT: toll-free number, M–F 6–6, BBS
Reader service no. 622

AGI Model 3000B
AGI Computer
48431 Milmont Dr.
Fremont, CA 94538
800/821-0806
LIST PRICE: with 2MB RAM; 1.2MB floppy drive, parallel, serial port; 101-key keyboard $1950. With 4MB RAM $2150
ACCESSORIES: 1MB RAM $170, 1024 by 768 VGA card $295, 14-inch VGA color display $590, DOS 4.01 $110
WARRANTY: one year, on-site service optional
EXTENDED WARRANTY: through dealer
SUPPORT: toll number M–F 6–5, BBS
Reader service no. 623

ALR BusinessVEISA 32CSX
Advanced Logic Research, Inc.
9401 Jeronimo
Irvine, CA 92718
800/444-4257,
714/581-9240 (fax)
LIST PRICE: with 1MB RAM; 1.2MB floppy; parallel, serial, mouse port. 101-key keyboard $2799. With 2MB RAM, 40MB IDE hard disk, 800 by 600 VGA card $4299; with 106MB IDE hard disk, VGA card $4999
ACCESSORIES: 1MB RAM $199; 40MB IDE hard disk $949, 80MB IDE hard disk $1099, 106MB IDE hard disk $1399, 1.44MB floppy with mounting kit $250; 14-inch 800 by 600 VGA color display
(continues)

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WHERE TO BUY

(continued)
$699; DOS 4.01 $150
WARRANTY: one year
EXTENDED WARRANTY: through dealer or Intel
SUPPORT: toll voice and fax numbers M–F 7–5, BBS
Reader service no. 624

CompuAdd 320sc
CompuAdd Corp.
12303 Technology Blvd.
Austin, TX 78727
800/627-1967,
512/335-6236 (fax)
LIST PRICE: with 1MB RAM; 1.44MB or 1.2MB floppy; one parallel, two serial, one game port; 1024 by 768 VGA; 101-key keyboard; DOS 4.01; Windows 3.0 $1295
ACCESSORIES: 2MB RAM $340; 40MB IDE hard disk $429, 80MB IDE hard disk $699, 110MB IDE hard disk $799; 1.2MB floppy $75; 14-inch 640 by 480 VGA color display $359
WARRANTY: one year optional on-site service
EXTENDED WARRANTY: available
SUPPORT: toll-free number
M–F 8–7, BBS
Reader service no. 625

Mitac MPC-2386e
American Mitac Corp.
410 E. Plumeria Dr.
San Jose, CA 95134
800/648-2287,
408/432-0866 (fax)
LIST PRICE: with 1MB RAM, 1.2MB floppy, one parallel and two serial ports, 800 by 600 VGA, 101-key keyboard, mouse, DOS 4.01, Windows 3.0 $1995
ACCESSORIES: 1MB RAM (installed) $100; 40MB hard disk with controller $470, 100MB hard disk with controller $770, 200MB hard disk with controller $1170; 1.44MB floppy $95, 14-inch VGA monochrome display $175, 14-inch 1024 by 768 VGA color display $495
WARRANTY: one year including free on-site service
EXTENDED WARRANTY: available
SUPPORT: toll-free number
M–F 7:30–5:30, BBS
Reader service no. 626

Tandon SL 320SX
Tandon
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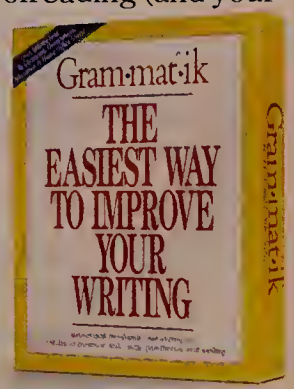

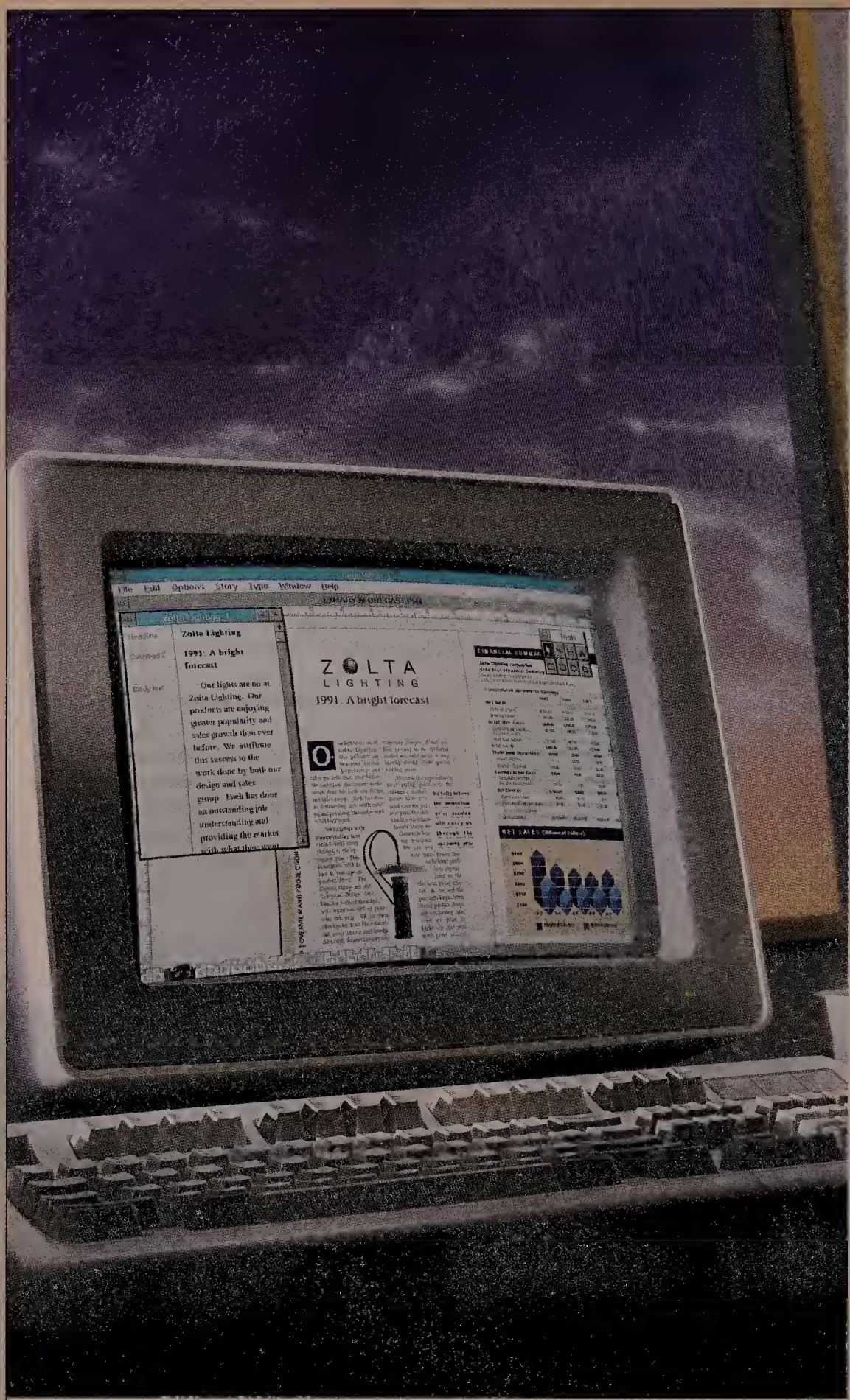

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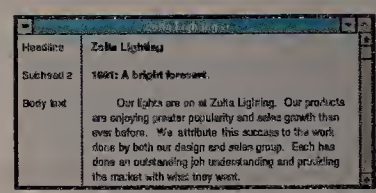

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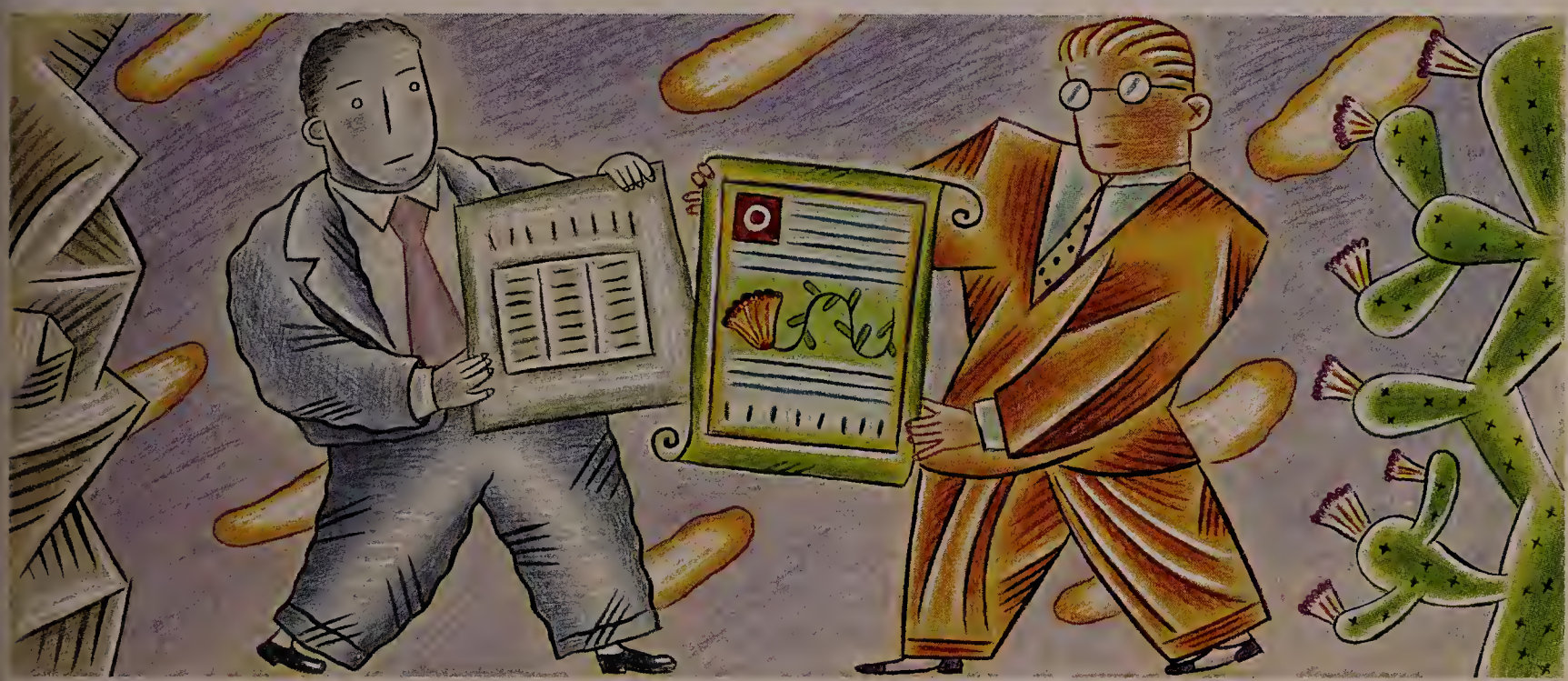
Will Your Next Word Processor Wear Windows?

True or false—Windows word processors are easier to use. True in most cases, but traditional programs still have their place.

George Campbell



Chances are you're a *WordPerfect* user. Nothing wrong with that—it's a very powerful program, and because there are so many other *WordPerfect* users out there, help with its complex inner workings is usually close at hand. But it's also likely that you're incorporating more and more fonts and graphics in your documents. If so, it's time you looked into *Windows*-based word processors like *Ami Pro* and *Word for Windows*—packages that make complex formatting and font control much easier.

Character-based programs like *WordPerfect* and *Word* still have a place, especially with users who are stuck with slower systems. To get decent performance with a *Windows* word processor, you'll need a 386SX PC with at least 2MB (and preferably 4MB) of RAM and a VGA display. Even on a capable 386, you'll find *Windows* word processors somewhat slower than their character-based rivals.

But few users will mind waiting a second or two longer to reformat a file if they can shave minutes off a job like setting up a table, changing fonts, or importing and scaling a logo. Character-based programs bog down when you move beyond simple formatting, but with graphical interfaces that sport icons, interactive dialog boxes, and flexible graphics manipulation, *Windows* packages make creating complex documents relatively easy. Their editing screens show accurate images of the printed page, including fonts, so you don't have to flip to a

Buying Smart: Sizing Up Word Processing Tools

Most users call on their word processor more often than any other application. For most, ease of use, editing, and formatting are the most important features, followed by customization and automation, performance, and graphics handling.

EASE OF USE

Look for well-organized menus that you can control with a mouse, along with keyboard shortcuts. Icons let you select common commands with a single click. You should also be able to decide which icons to display and assign selected commands or macros to icons or menus. Also, look for context-sensitive help and good documentation.

EDITING

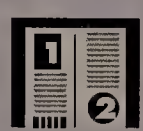
All these packages provide essentials such as cut and paste; word, line, sentence, and paragraph delete; global search and replace; and undo commands. Look for the ability to display multiple files at once and to edit documents in several views, ranging from draft text to complete graphics. Most will want an editing screen that accurately represents printed output—at the very least, demand a page preview mode.

More advanced editing features can be broken down into three categories:

Writing aids. At a minimum, you need a complete spelling checker with custom, user-defined dictionaries and a thesaurus that offers synonyms and definitions. An outliner is a big help, especially if you can expand and collapse the outline and include standard text. Only one program here includes a built-in grammar checker.

Long-document options. At the very least, look for automatic table of contents and index generation. You may also want bookmarks for jumping to fixed locations in a file, and cross-references, which automatically update tables, figures, and "see page xx" references as your document changes. Academic users will want capable footnoting tools, and engineers and financial experts will want an equation editor.

Group editing tools. If you're on a LAN, you'll want such multiuser tools as annotations, which embed hidden notes within documents, and redlining, which compares documents and marks suggested additions and deletions automatically. Work groups also need complete document summaries that include revision tracking (automatic marking of who edited what and when). LAN support that allows users to browse files that others are working on—but not to edit them—is essential.



FORMATTING

Today's documents are more complex than ever. Demand a full range of text formatting and page layout features such as the ability to format newspaperlike snaking columns. It should be easy to select fonts, and you want to be able to use scalable fonts on printers that support them.

Style sheets let you quickly tag paragraphs with style formatting, making it unnecessary to repeat complex commands. Look for style sheets that you can save separately from the document so you can copy them easily to other documents. More advanced desktop publishing features include kerning and tracking, which let you modify the space between letters and words—a handy feature for headlines.

CUSTOMIZATION AND AUTOMATION

These business-oriented features help you link your word processor with other applications. Most important is a macro language with a learn mode that lets you automatically record keystrokes for later playback. Just in case you require more advanced automation, make sure the language is programmable, so you can write the macros directly. One nice touch is an automated template function that lets you set up forms and documents with custom formatting and prompts for users to fill in the blanks.

Look for a mail merge function (which matches form letters with lists of addresses) equipped with user prompts. Conditional commands let you further customize your mailing,

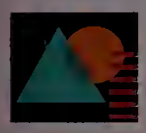
separate preview mode to view the overall effect. Also, *Windows* packages function more logically than *WordPerfect*—you select the text and *then* act upon it, rather than vice versa.

If you're still unsure whether *Windows* word processing is the answer, you'll find help in these pages. First, investigate our decision tree ("Know Your Options: Pick Your Word Processor") to find the right questions to ask. Then check out "Five Problems in Search of a Word Processor" to see what applications best match your situation. Next, see "Windows Word Pro-

for example, by inserting an extra paragraph for customers above a certain income. Spreadsheet links that can automatically insert the latest worksheet version are helpful. You'll then want a table editor to format the worksheet by easily adjusting columns and adding lines and shading.

PERFORMANCE

Speed is important, yet our tests show surprisingly small differences among most of the packages. *Word 5.5* is the overall champ, followed closely by *WordPerfect*. The *Windows* group is a bit slower, but still pretty quick on a 386. Users of 286 systems will find that the *Windows* packages run much more slowly. See the PC World Test Report for more details.



GRAPHICS

Graphics are playing an expanding role in business documents. A program should import a variety of formats; let you move, crop, or scale an image with the mouse alone; and wrap text around graphics automatically. Look for a frame-based approach to text and graphics—because you simply draw frames in which to pour text and graphics instead of assigning coordinates, it's easier to move and resize the elements. Additional features like drawing, charting, and scanning modules are nice extras—you may not need to buy separate packages for these functions.

cessing—Thumbs Up or Thumbs Down?" for two opposing views on the subject. Finally, our "Buying Smart" sidebar is your guide to the make-or-break features to look for.

Ami Pro 1.2

PROS: Easy to use, flexible editing views, superb graphics handling, business graphics

CONS: Weak outliner, no redlining, no cross-references

Beg or borrow time on a system running *Ami Pro,* and you'll soon see what a word processor *should* be. Matching rival *Word for Windows* at formatting and all but the most advanced editing tools, *Ami Pro* has an edge in ease of use and a solid advantage at graphics. It's the Best Buy for *Windows* users.

Ami Pro's interface is the easiest to use in the roundup. A customizable icon bar runs down the left of the screen—you can select 12 icons from a long list or assign your own macros to icons. The program lacks its *Windows* rivals' push-button ribbon for quick text formatting, but you can set up similar functions in the icon bar. Most will appreciate the optional floating style-sheet window—properly positioned, it can reduce the distance your mouse travels when you're tagging paragraphs with styles. You can also select tags from pulldown menus or with function keys.

Ami Pro provides the most flexible screen views in the roundup—you can choose from full-page, half-page, magnified, and fast draft views or create your own custom magnification. With version 1.2, *Ami Pro*'s vexing lack of windowing support is a thing of the past—you can open up to nine files at once, and cut and paste among them. *Ami Pro*'s macro language is powerful, letting you create new menus or add your own macros to existing menus.

The style sheets are unsurpassed. Unlike with *Word for Windows,* you can create or alter a style using a single dialog box, and because style sheets travel separately from documents, it's a little easier to store and apply them. Not only are *Ami Pro*'s one-stop dialog boxes well organized, but they show examples—if you alter a setting, the changes show up in a preview window, so you don't have to wait for the screen to reformat to view the effect.

Ami Pro's layout and graphics skills are unmatched. Because you locate and manipulate text and graphics elements in frames, as in a desktop publishing program, they're easier to manipulate than in *Word for Windows.* After creating a frame, just drag it around or size it with the mouse. Another bonus: You can alter brightness and contrast on scanned TIFF images, so you don't need to use a separate scanning utility.

If you need a chart, a table, or a drawing on the spot to back up your document's message with images, the tools are built right in. The chart module offers bar, pie, and line styles, with legends and colors, in flat, three-dimensional, or even perspective formats.

Ami Pro has a few weak spots—for long documents, you'll miss *Word for Windows'* cross-referencing tools, which automatically update references to tables and figures, and *Ami Pro*'s outliner can't expand and contract to include document text. Also missing is redlining—collaborative work groups will have to use a third-party program like *ForComment* to compare edits.

If you can live with these gaps, *Ami Pro* may well be your next word processor. Its ease of use, formatting prowess, and graphics power make it a Best Buy for just about everyone.

Legacy 1.1

PROS: Advanced desktop publishing features, text flow between frames

CONS: No macros, weak group editing tools, slow printing, poor menu organization, no multiple windows

NBI's *Legacy* offers a formidable formatting and graphics repertoire aimed at desktop publishers. Missing some advanced editing tools like math, macros, and redlining, *Legacy* can't match its *Windows* rivals, but it's a good value if light desktop publishing is your goal.

At press time, WordStar International announced that it had licensed the

FEATURES EVALUATION

Best Buys Combine Ease of Use, Abundant Features

Best Buy Ami Pro combines Windows' ease of use and uninterrupted view of the page with loads of formatting and graphics features. For those with less need for fonts and graphics (and for those without a 386), Best Buy Word 5.5 is nearly as easy and provides better group-editing features.

● Yes ○ No
◒ Deficient
▼ Limited only by available disk space

	Ami Pro 1.2	Legacy 1.1	Microsoft Word 5.5	Microsoft Word for Windows 1.1	MultiMate 4.0	WordPerfect 5.1	WordStar 6.0
Standard features							
Memory required	1MB	1MB	384K	1MB	384K	384K	384K
Disk space required	4.5MB	5.2MB	2.5MB	3.2MB	8MB	4.5MB	3.5MB
Uses mouse	●	●	●	●	○	●	○
Editing							
Basic editing							
Custom editing views	●	●	●	○	○	○	○
Page preview	●	●	●	●	●	●	●
Math functions	●	○	●	●	●	●	●
Maximum windows	9	1	9	8	1	2	2
Undo/undelete levels	4	1	1	1	▼	3	1
Writing aids							
Spelling checker/thesaurus	●	●	●	●	●	●	●
Outliner	◒[1]	◒[1]	●	●	○	◒[1]	◒[1]
Grammar checker	●	○	●	○	●	○	○
Long-document options							
Index/table of contents	●	●	●	●	●	●	●
Bookmarks	●	○	●	●	◒[2]	●	●
Cross-referencing	●	●	●	●	○	●	○
Footnotes/endnotes	●	●	●	●	●	●	●
Group editing tools							
Annotations	●	●	●	●	●	●	●
Redlining	●	○	●	●	●	●	○
Document summary/revision tracking	●	○	●	●	●	●	○
Multiuser file browsing	●	○	●	●	○	●	◒[3]
MHS E-mail module	●	○	●	○	●	○	○
Customization and automation							
Programmable macros	●	○	●	●	○	●	○
Macro learn mode	●	○	●	●	●	●	○
	BEST BUY		BEST BUY				

Legacy source code from NBI and would sell the program under a new name. Later in the year, WordStar will modify the code and release *WordStar for Windows.* NBI, however, will continue to sell and update its own version.

NBI has taken good notes from the competition. Like *Word for Windows, Legacy* offers an icon bar for quick font, formatting, and alignment changes. Like *Ami Pro,* it displays examples of some formatting choices in dialog boxes, but not for as many options. You can edit in a speedy draft view or one of three graphical views, and like *Ami Pro, Legacy* lets you set up a customized view with whatever magnification you prefer.

Despite these pluses, *Legacy* is harder to learn and use than its *Windows* competitors. For example, to modify a frame, you must first click on an icon, then move to the pulldown menus, negating the benefit of the icon shortcut. Style controls are scattered among the

	Ami Pro 1.2	Legacy 1.1	Microsoft Word 5.5	Microsoft Word for Windows 1.1	MultiMate 4.0	WordPerfect 5.1	WordStar 6.0
Customization and automation (contd.)							
Mail merge	●	◒[4]	●	●	●	●	●
Spreadsheet links	●	●	●	●	●	●	●
Table editar	●	●	◐	●	○	●	○
Equatian editor	◐	○	◐	●	○	●	○
Automated templates	◐	○	◐	●	○	○	○
Formatting							
Basic farmatting							
Style sheets	●	●	●	●	○	●	●
Uneven column widths	●	●	●	●	●	●	●
Ican formatting shortcuts	●	●	●	●	○	○	○
Canditianal page breaks	●	●	●	●	○	●	●
Kerning and tracking cantrals	●	●	◒[5]	●	◒[5]	●	◒[5]
Text farmats imparted	15	18	3[6]	11	13[6]	11	6
Text formats exported	14	17	3	11	13	8	6
Printing							
Background/queue printing	●	●	●	●	●	●	●
Supparts LaserJet III scalable fonts	●	●	●	●	○	●	●
Prints broken range of pages	◐	●	●	○	○	●	●
PastScript suppart	●	●	●	●	◒[7]	●	●
Graphics							
Move, size, crop graphics	●	●	●	●	●	●	●
Flow text araund graphics	●	●	●	●	○	●	○
Frames for text and graphics	●	●	◐	○	○	○	○
Snap-to-grid	◐	●	◐	○	○	○	○
Lines, baxes, borders	●	●	●	●	◒[8]	●	◒[9]
Drawing pragram	●	●	◐	○	●	○	●
Charting madule	●	○	◐	○	○	○	○
Brightness/cantrast cantrol for scanned images	●	○	◐	○	○	○	○
Overlays text on graphics	●	●	◐	○	●	○	●
Graphics farmats imported	7	9	10	14	11	14	1
	BEST BUY		BEST BUY				

[1] Na expand ar cantract.
[2] Baakmarks nat named; jump only ta next mark.
[3] Multiple users may read files but can't save them.
[4] No canditianal merge cammands.
[5] Na tracking cantrol.
[6] No PastScript file expart.
[7] Additional canversions available fram publisher.
[8] Na autamatic baxes.
[9] Must enter line-drawing characters one by one.

Edit, Create, and Format menus, and styles are stored with the document, making it too easy to overwrite style sheets accidentally.

There are other annoyances. Network support is limited—when a file is in use, a second user can't browse it—and the mail merge module lacks user prompts and conditional commands. *Legacy* is also a disk hog, storing all text and images in *Ventura*-like chapters—if you use a graphic in more than one document, it's wastefully duplicated in each file. Worse, you're limited to displaying one document at a time unless you load a second copy of *Legacy*, and printing is the slowest in the roundup.

Legacy's big draw is its precise control over page layout. Like *Ami Pro*, it's a frame-based system and so is especially adept at handling graphics and boxed text. *Legacy* is the only program reviewed that lets you precisely position frames with snap-to columns and grids

—horizontal and vertical lines that snap page elements into place as if they were magnetically attracted. Better yet, its letterspacing (kerning) and word spacing (tracking) controls are tops in the roundup. It's the only program that lets text flow between frames—perfect for newsletters with continuing stories. But where *Ami Pro*'s frames are optional, *Legacy* makes you set up frames for even the simplest text documents—a bothersome extra step.

Legacy's lack of macros and weak mail merge rule it out for many offices. But it's a good deal for users who need some desktop publishing features for creating newsletters and don't want to master *PageMaker* or *Ventura.*

Microsoft Word 5.5

PROS: Easy Windows-like interface, fastest in roundup, powerful macro language, easy editing tools

CONS: No table editor, limited file import routines

Version 5.5 of *Microsoft Word* now works much like its *Word for Windows* cousin. *Word*'s treasure chest of features is now more accessible, thanks to pulldown menus, pop-up dialog boxes, and fully adjustable windows. Equally powerful at editing and formatting and the fastest program in the roundup, *Word* is the Best Buy for non-*Windows* users.

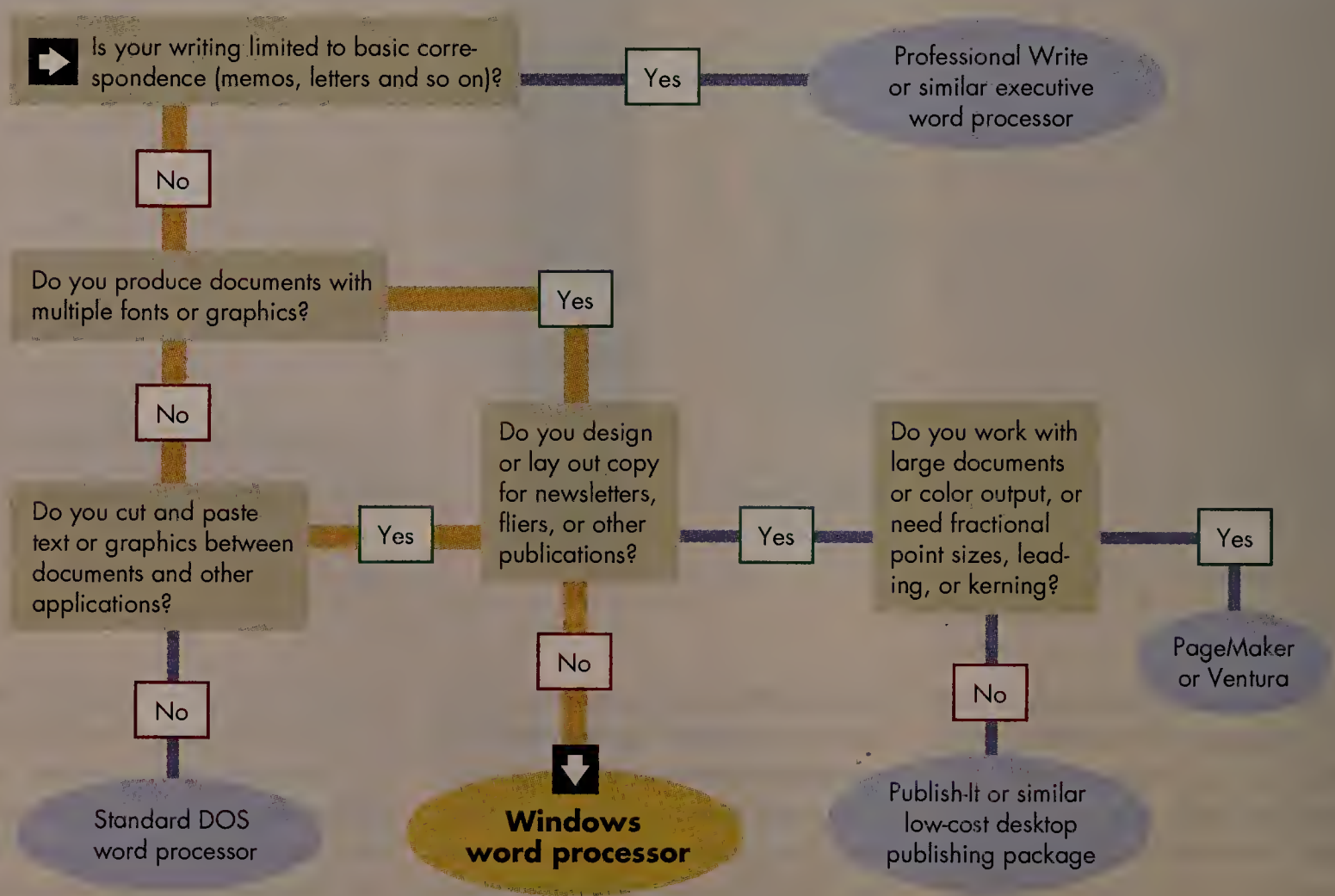
Version 5.5 is much easier to learn and use than version 5.0. It's still character based, but it imitates *Word for Windows'* graphical interface—an icon-based Ribbon and Ruler puts most formatting tasks only a mouse click away. You can open up to nine windows and quickly block text for cut and paste or formatting. There are only a few text import routines, but you can buy an inexpensive conversion utility that imports and exports to all major formats.

New, well-designed dialog boxes simplify formatting, and *Word*'s powerful style sheets are much easier to use. *Word*'s graphics-handling skills are the best among the character-based products—you can even wrap text around

KNOW YOUR OPTIONS

Pick Your Word Processor

Answering a few questions about the word processing you do will point you toward the right tool. Use this decision tree in conjunction with "Five Problems in Search of a Word Processor."



Five Problems in Search of a Word Processor

Which word processor fits your profile? That depends on how you'll use it. Below, look for the situation that best matches your own. That scenario will show you which features and performance issues to watch out for and will help you better interpret the Features Evaluation and PC World Test Report.

Corporate Word Processing Pool

Production is the key here. In most cases, employees will be doing simple, heads-down typing, with document layout decisions made elsewhere. Speed and simplicity are crucial. There are probably more 286 units than 386 PCs in this shop, so *Windows* programs are out.
Key features: Fast editing, excellent mail merge, style sheets, macro language, good network compatibility, group editing tools
Key tests: All
Recommendation: *Word, WordPerfect*

Management

Managers need tools with easily accessible features. These users prepare memos, letters, reports, and presentations and frequently have state-of-the-art hardware, so a *Windows* application is appropriate. Managers often include tables and graphics in their documents but usually lack the time to master advanced features.
Key features: Ease of use, excellent page formatting, table editor, spreadsheet links, easy graphics manipulation, charting
Key tests: Tests on complex files
Recommendation: *Ami Pro*

GORDON STUDER

Word Processing Professional

This category includes technical writers, journalists, academic users, editors, and creative writers. They work primarily with relatively unadorned text; powerful layout tools are largely unnecessary, but writing aids are a plus.
Key features: Speed, powerful editing tools, macro language, spelling checker, thesaurus, outliner, multiple-file windowing, file conversion tools, footnotes
Key tests: Tests on simple files
Recommendation: *Word, WordPerfect*

Collaborative Work Group

These users work together to prepare large compound documents designed by a variety of people. Typically produced in a networked setting, the documents undergo numerous revisions. This scenario makes big demands on word processors, requiring the incorporation of spreadsheet data and charts to create large, complex reports.
Key features: Document summaries/revision tracking, redlining, annotations, outlining, long document features, powerful graphics manipulation, spreadsheet links, charting and table tools
Key tests: Tests on complex files
Recommendation: *Word for Windows*

Light Desktop Publishing

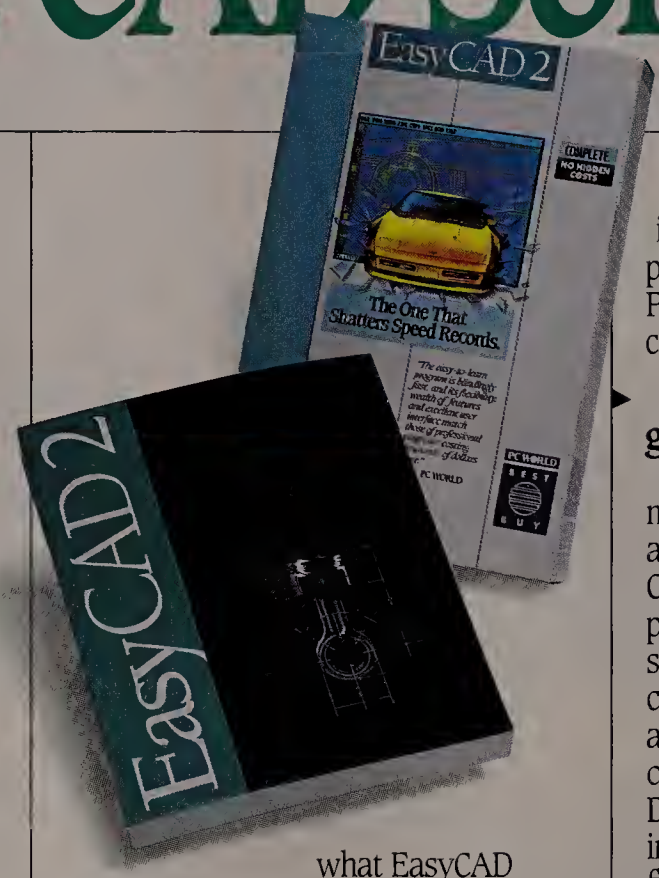
Users in this category prepare brochures, newsletters, and heavily formatted reports. Often gathering graphic and type elements from different sources, they need tools approaching full-scale desktop publishing programs. Because the screen must closely imitate printed output, state-of-the-art equipment is a given here, making a *Windows* program a natural choice.
Key features: Access to multiple fonts, extensive layout tools, frames for text and graphics, table editor, laser/PostScript printer support, file conversions, accurate screen images, spreadsheet links
Key tests: Tests on complex files
Recommendation: *Ami Pro, Legacy*

images.

Advanced editing features are also complete. The mail merge and long-document features are powerful, and the outliner, which can include document text and collapse and expand, is outstanding. *Word*'s macro language is second only to those in *Ami Pro* and *Word for Windows*—too bad it's largely incompatible with version 5.0's.

Academic and legal users who need formula editing, tables, and combined footnotes and endnotes will probably prefer *WordPerfect*. But for most business applications where *Windows* isn't an option, *Word 5.5* is the Best Buy. If you're planning to move to *Windows* but don't have the horsepower to make the switch now, *Word 5.5* is a nice stepping-stone, offering the feel of *Windows* without the overhead.

New EasyCAD 2.60 Tops the #1 Rated CAD Software



Number 1 in user satisfaction–PC Week poll.

In competition against other top CAD software for performance, hardware compatibility, ease of use and value, EasyCAD 2.05 handily won the award that counts most–User Satisfaction. Now the best is even better.

You Pay Only $169.95 for the Program CAD Users Rate Number 1.

PC WORLD said it best, "This easy-to-learn program is blindingly fast, and its flexibility, wealth of features and

excellent user interface match those of professional programs costing thousands of dollars more."

In fact, because it is written entirely in assembly language experts say new EasyCAD 2.60's speed rivals CAD packages costing up to twenty times more. So why spend well over $2000 to get what EasyCAD 2.60 can deliver for just $169.95?

Expanded, productivity-boosting associative dimensioning.

EasyCAD 2.60's associative dimensioning feature allows you to rotate, stretch or change the scale factor of a drawing and all dimensions are instantly updated to reflect the change. This includes ordinate, angle, radius and diameter as well as other dimension formats. You never have to erase or re-enter dimensions.

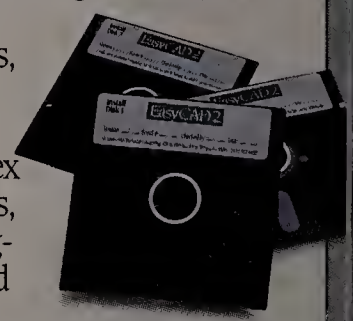
Whisk through even the largest drawings.

An enhanced memory manager lets you work through the largest drawings faster than ever.

Plot to file means you can store drawings on disk now and send it to the printer later. And version 2.60 supports PostScript printer fonts and line weight controls.

More features, less money–guaranteed.

No other CAD software gives you so many features for so little money (and a 30-day money back guarantee): Customizeable pull-down menus, script and macro capabilities that automate complex or repetitive tasks, DXF for exchanging drawings and files with other CAD programs and spread sheets. The list goes on.



Call 1(800)874-4028 now for more information, plus the name of your nearest dealer. If you already own EasyCAD, ask about our special 2.60 upgrade offer.

PC WORLD BEST BUY

CORPORATE TOP RATED PC WEEK 1990 SATISFACTION POLL

EVOLUTION EasyCAD 2 COMPUTING

437 S. 48th St., Ste. 106
Tempe, AZ 85281-9936
1(800)874-4028

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as *Ami Pro,* nor is it as clever in its handling of graphics. Still, it's an excellent value for a variety of needs, and it's especially well suited for corporate work groups where group editing tools, macros, and templates are required for customization.

MultiMate 4.0

PROS: Grammar checker, built-in E-mail

CONS: Poor font support, slowest in roundup, confusing interface, no mouse support, weak formatting tools, no macros, no style sheets

Harking back to an age of dedicated word processors and daisy wheel printers, Ashton-Tate's *MultiMate* seems anachronistic. Version 4.0 attempts modernization with pulldown menus, laser printer support, page preview, and graphics integration, and it's the only program in this review to give you grammar-checking and LAN E-mail modules. Yet the new features are often poorly implemented, and performance is by far the slowest in the roundup. *Word* and *WordPerfect* are much better choices.

Unlike most modern word processors, *MultiMate* makes you edit one page at a time—inserting text on a full page doesn't reformat the document. Editing is a slow, multikeystroke process, with prompts like 'Copy what?' and 'To where?' interrupting your editing. The lack of mouse support, context-sensitive help, and windowing doesn't help.

Formatting is difficult—there are no style sheets, and *MultiMate* uses confusing formatting codes. Worse, there are no shortcuts for using boldface or italic type—instead, you must change fonts. To print on LaserJet or PostScript printers, you choose a special command (not Print) and fill out a lengthy dialog box.

To integrate graphics, you must use a separate add-on utility, and options are limited. While you can import numerous formats and even draw simple images, text doesn't wrap around graphics, and it's difficult to position images. Other features are also lacking—there's no table editor, outliner, or macro language.

MultiMate does have its unique benefits. It includes the superb *Grammatik*

Windows Word Processing—Thumbs Up or Thumbs Down?

BRAD BOWER

Thumbs up:

"I've been a diehard *WordPerfect* user for years, but I'm switching to *Word for Windows.* It's much easier to use because you don't have to remember commands or look at a template—all you do is select an icon. The structure is more logical—you select something and *then* you tell the program what to do with it. That can be difficult at first for DOS veterans, but it's faster for new users. Also, the mouse makes it much easier to cut and paste text, and with the Clipboard, it's easier to link up with my spreadsheet. If I'm copying a range from *Excel,* I don't have to write down the range first—I can see the spreadsheet in another window and mark the range on screen. I can't wait to see *WordPerfect for Windows.*" —*Nancy Louis, PC trainer and consultant, Newtown Square, Pennsylvania*

MARK LUINENBURG

Thumbs down:

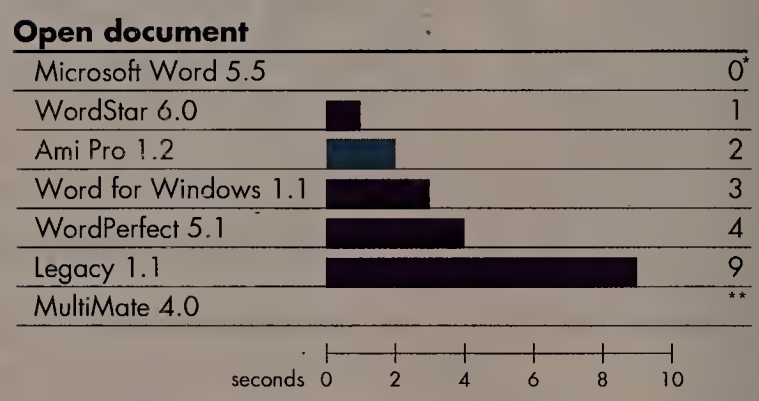
"I've tried using *Windows 3.0* on a 386 with 4MB of RAM, and I *still* don't care for it. Jumping back and forth between the mouse and the keyboard gets irritating—I don't like having to take my hand off the keyboard in order to use the mouse. I can move around faster by using arrow keys than most people can with a mouse—and once you know what you're doing, shortcut keys are faster. Also, we're bumping into technical problems with *Windows 3.0*—it tends to lock up when you try to move large parts of a document, and we get unrecoverable application errors all the time." —*Dann Sandell, business analyst, Minneapolis, Minnesota*

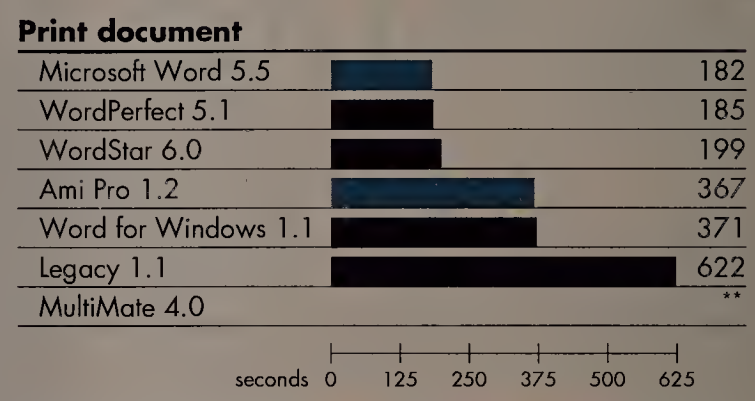
PC WORLD TEST REPORT

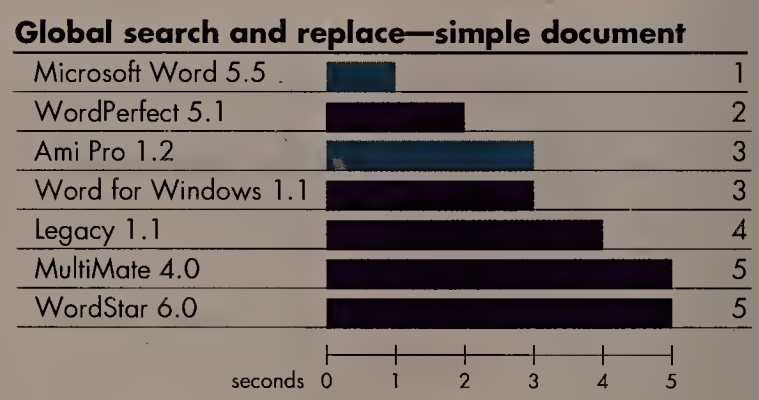
Word and WordPerfect Zip Past Windows Rivals

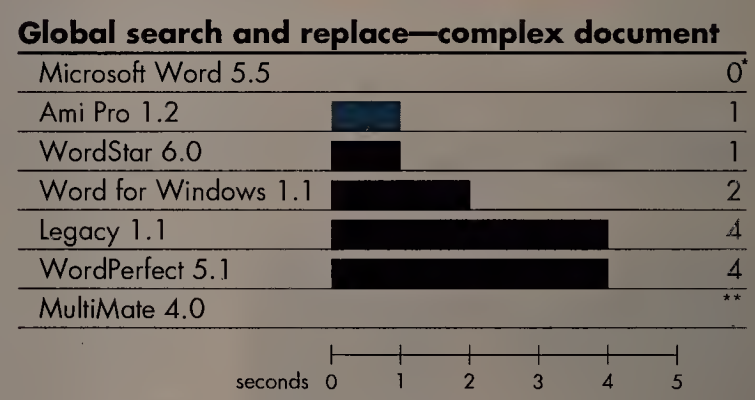
Ami Pro and Word for Windows are surprisingly fast (except in printing), but character-based Word and WordPerfect still have the performance edge.

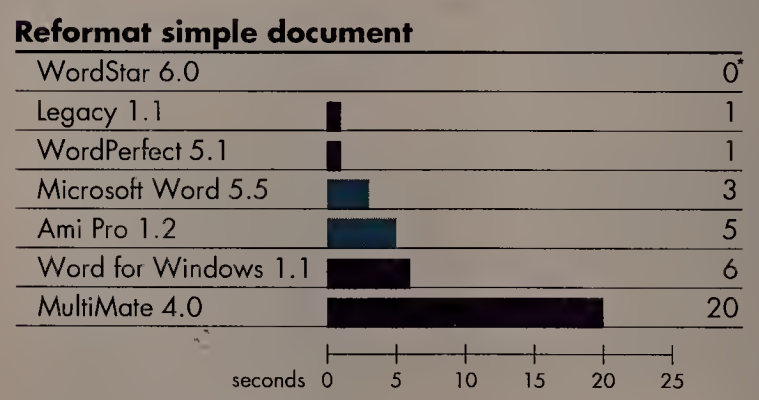
Best Buy

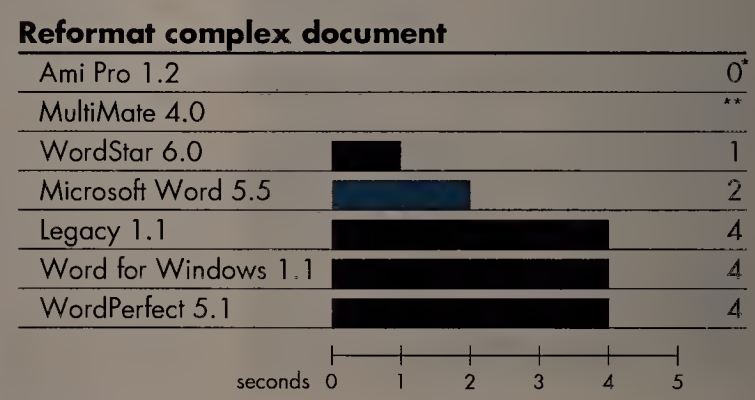












*Elapsed time was less than 1 second.
**MultiMate 4.0 is unable to handle proportionally spaced text. As a result, it couldn't open our complex document and was unable to complete the test.

Methodology
All tests were performed on a 20-MHz Compaq Deskpro 386/20e with 2MB RAM and a 110MB hard disk. For tests of *Windows 3.0* products, we included a mouse and ran the tests in standard mode. For non-*Windows* products, we used Quarterdeck's *QEMM 5.11* to convert 1MB of extended RAM into expanded memory. The products were benchmarked using a simple, 19-page text-only document and a 4½-page complex document containing subheads, a *1-2-3 2.2* worksheet table, a monochrome PCX image, and a Lotus PIC graph. Simple document tests were printed on a Hewlett-Packard LaserJet Series II; complex documents used a QMS PS810 PostScript printer. We tested products offering more than one editing mode in their default mode.

Open document
We measure the time from initiation of the command until the complex document is open.

Print document
We measure the time to print the complex document from initiation of the command until the last page is ejected from the printer.

Global search and replace—simple document
We measure the time spent searching for 104 incidences of a six-letter word and replacing with a seven-letter word (from initiation of the command until cursor control is returned).

Global search and replace—complex document
We measure the time spent searching for 75 incidences of a seven-letter word and replacing with a ten-letter word (from initiation of the command until cursor control is returned).

Reformat simple document
We enlarge the top margin from 1 inch to 1½ inches and measure the time necessary to reformat.

Reformat complex document
We change the base font for the body text from Palatino to Times Roman and, if necessary, initiate a reformat command. The benchmark is taken only on the time spent reformatting.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

It's probably because they want to avoid comparison. Next to our SyncMaster™4 the differences become very apparent. Our flat screen EVGA monitor lets you have a full inch more than NEC's Multisync 4D, yet it sells for the same price.

With its 17″ display, the SyncMaster™4 gives you more space to create in, from larger windows to more legible text. And the flat surface screen does it all without the strain-producing glare you get from round face displays like the Multisync 4D. When you include its additional up front controls for easy access, our SyncMaster™4 is the clear choice.

And the SyncMaster™4 is backed by Samsung, the world's largest monitor manufacturer and the 20th largest corporation worldwide.

So if you want to see your EVGA graphics come to life, look at a Samsung. Then call 1-800-624-8999, extension 85T for your nearest dealer.

It won't be hard to tell the difference.

	Samsumg SyncMaster 4	*NEC Multisync 4D*
CRT Diagonal size	*17 inches*	*16 inches*
Maximum Display size	*300mm x 224mm (HxV)*	*290mm x217mm (HxV)*
Screen type	*Flat face*	*Round face*
Cabinet depth	*453mm*	*475mm*
Controls	*On/off up front* *Degauss up front* *pincusion up front*	*On/off recessed* *Degauss in back* *None*
Modes	*Supports EGA*	*None*
Retail price	*$1499*	*$1499*

Now you know why they don't show screen graphics in their ads.

Samsung 17" flat screen SyncMaster 4

NEC 16" round screen Multisync 4D

Unretouched Photography.

See us at
Booth Number
5309

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Technology that works for life.

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Everything.

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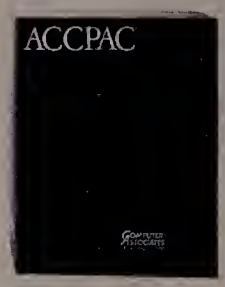

No matter what you need to do—send an invoice, pay a bill, write a paycheck—ACCPAC provides a quick and simple way to do it. And it's so easy to learn you'll have it up and running in minutes.

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EXECUTIVE SUMMARY

Word Processing Best Buys for Windows and DOS

Ami Pro and Word edge out Word for Windows and WordPerfect.

These seven top word processors can handle anything from LAN-based group edits to nicely formatted newsletters. The Windows products make polished output a breeze, but they need powerful hardware to run at a decent clip.

Ami Pro takes Best Buy overall—it provides the friendliest interface, excellent editing and formatting, and superb graphics manipulation. **Word for Windows** can't match **Ami's** effortless icons, but it offers unsurpassed customization and automation to work groups. Ironically, Best Buy **Word 5.5** boasts better ease of use than **Word for Windows,** along with terrific editing and long-document features. The ever-popular **WordPerfect** nearly matches **Word 5.5** feature for feature, but **Word 5.5** has the better interface.

	Ami Pro 1.2	Legacy 1.1	Microsoft Word 5.5	Microsoft Word for Windows 1.1	MultiMate 4.0	WordPerfect 5.1	WordStar 6.0
Ease of use	Excellent	Fair	Excellent	Good	Poor	Good	Fair
Editing	Excellent	Good	Excellent	Excellent	Poor	Excellent	Fair
Formatting	Excellent	Excellent	Good	Excellent	Fair	Good	Fair
Customization and automation	Good	Fair	Good	Excellent	Poor	Excellent	Fair
Performance	Good	Fair	Excellent	Good	Poor	Excellent	Good
Graphics	Excellent	Excellent	Good	Good	Fair	Good	Fair
Overall value	Excellent	Good	Excellent	Excellent	Poor	Excellent	Fair
	BEST BUY		BEST BUY				
Reader service no.	609	610	611	612	613	614	615

How we rate word processors
Our evaluations are based on information in the Features Evaluation and PC World Test Report, combined with our opinions of quality, reliability, ease of use, and suitability for word processing tasks.

Ease of use is critical in these much-used applications. To earn an Excellent rating, a program must have a consistent interface that makes it easy to edit and format text and manipulate graphics. It must offer mouse support, full menus and shortcut keystrokes, icon shortcuts, context-sensitive help, unlimited technical support, and good manuals.

Editing tools should be fast and intuitive. An Excellent rating here demands fast editing commands, easy cut and paste, text selection with the mouse, an undo command, and the ability to cut and paste between multiple documents. A program must also offer one-step spell checking, a good thesaurus, and an integrated outliner; deliver solid long-document features; and include capable group editing tools.

Customization and automation covers features that let you personalize the program and help you integrate the package with other business applications. To win an Excellent, the program should provide a programmable macro language and a macro learn mode. It should also offer a table editor and powerful, conditional mail merge.

Formatting tools are key to preparing today's complex documents. To be rated Excellent in this category, a program must offer a complete selection of formatting options, multiple columns, style sheets for quick formatting, easy selection of fonts, and an editing screen display that mimics the printed page.

Performance is based on PC World Test Center benchmarks. To earn an Excellent mark, a program must provide fast speeds in all six tests.

Graphics are becoming increasingly crucial. Here, an Excellent rating means that a program offers a frame-based approach to formatting graphics and permits scaling and cropping of images. Extra points are given for a charting module and drawing tools.

Overall value weighs all of the categories above plus price and gives extra weight to ease of use, editing, and formatting.

IV grammar and style checker, and the program excels at group editing—there's an excellent document summary and good redlining, annotations, and revision tracking. Network members can use a built-in MHS-compatible E-mail program. Unfortunately, the network version prohibits a second person from browsing files that are in use.

All told, even current *MultiMate* users should consider switching.

WordPerfect 5.1

PROS: Table and equation editors, excellent customer support, extensive printer and font support

CONS: Fairly difficult to learn

WordPerfect is an industry standard—and consequently, it's easy to overlook a few of its flaws. Cautious buyers can rest assured they won't be left out on a limb. *WordPerfect* is bound to be supported for years to come, and you'll never have to go far to find knowledgeable users and add-on utilities. It's still not as easy to use as *Word*, but you'll find compensation in friendly, toll-free technical support, fast performance, and top-notch features. *WordPerfect* is an excellent all-around word processor, and it's especially fitting for academic and legal users.

(continues)

Now you can upgra
without upgradi

An unimpressive report is something you'll never have to create again.

Align titles or text across a range of columns—left, right, or center—with one simple command.

You can wrap text around graphs automatically.

Add freehand drawings or symbols to call attention to critical data.

A feature that only 1-2-3 offers to DOS spreadsheet users is the ability to embed as many "live" graphs on a worksheet as you'd like.

Improved, 3D-effect graphs can add even more impact to your report.

Mix bold, italics, underlines, colors, and typefaces to create over 100 text style combinations—more than any other spreadsheet.

Thanks to Auto Compress, you can easily make an entire report fit on one page.

WeCycle Waste Corporation
The Materials Research Group Recommendation:
FOCUS: ALUMINUM

-- Research Group provides the
continue to

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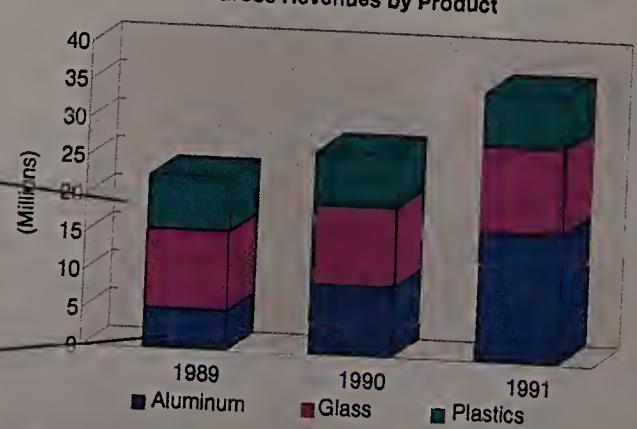
during

WeCycle Waste Corporation

The Materials Research Group Recommendation:

FOCUS Aluminum

This study conducted by the Materials Research Group provides the basis for our most recent recommendation that WeCycle continue to expand its aluminum recycling capacity by another 70% over the next 6 years. The graph to the right shows the increasing proportion of our business provided by the aluminum division during the past three years, now approximately half of all revenues. It is our opinion that, at this rate of growth, aluminum recycling will continue to offer our company its greatest opportunity for expansion over the next decade, and certainly into the 21st century.



WECYCLE PRODUCT	1989	1990	1991
Aluminum			
East	2,323,426	4,019,527	7,315,539
Central	1,372,347	2,374,160	4,320,972
West	1,726,492	2,986,831	5,436,033
Total	5,422,265	9,380,518	17,072,544
Glass			
East	2,496,721	2,567,821	2,798,925
Central	3,598,757	3,217,693	3,507,285
West	4,217,635	4,471,294	4,873,710
Total	10,313,113	10,256,808	11,179,920
Plastics			
East	2,897,493	3,171,243	3,234,668
Central	1,873,938	1,823,697	1,860,171
West	2,378,942	1,967,421	2,006,769
Total	7,150,373	6,962,361	7,101,608

Glass and Plastics

As can be inferred from the graph to the left, glass and plastics recycling has been holding steady throughout this same period, and has consequently become a smaller proportion of our overall sources of revenue.

Although this group would strongly recommend that WeCycle Waste Corporation do all that is necessary to increase its activities in these areas, our studies have shown that aluminum will become increasingly the material of choice in the shipping, heavy manufacturing and container industries.

Aluminum

It is our opinion that sources of aluminum products will be pressed close to their limits over the next decade.

Therefore, we propose that WeCycle Waste Corporation invest in more aluminum capacity during the next five years in order to take the best advantage of this increasing market demand.

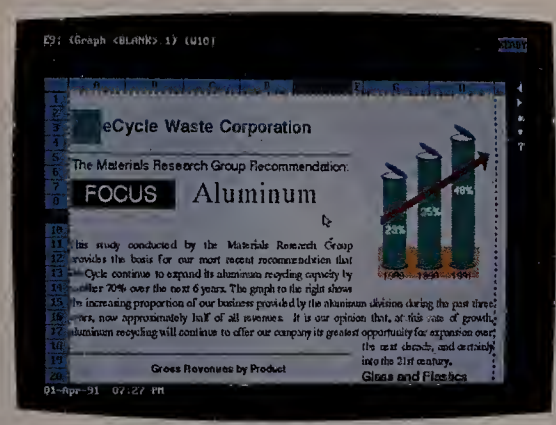
le your spreadsheet
ng your hardware.

There's a lot to like about the new Lotus® 1-2-3® Release 2.3.

For starters, it's not just a graphical spreadsheet. It's a fast, graphical spreadsheet for DOS. It's easy to use. And it works as well on an older XT with just 512K of memory as it does on the newest 486 machine.

It also shares many features in common with our powerful 3D spreadsheet, Release 3.1. Including its superb spreadsheet formatting and publishing capabilities and full mouse support. Along with its popular Auto Compress feature that gives you a trouble-free way of making larger worksheets print on a single page.

We've also added new features you won't find in other spreadsheets. Like the Viewer (based on Lotus Magellan® technology) which helps you find the file you want before retrieving it. And a very helpful Auditor that simplifies the job of documenting and analyzing complex worksheet logic.



With its WYSIWYG graphical environment, you can do all your formatting "live" on screen.

Of course, you won't just like what Release 2.3 does. You'll like how it feels. It's quick and smooth. With a WYSIWYG (what-you-see-is-what-you-get) graphical environment that lets you format text, data, and graphics "live" on screen. Plus, what you see on screen is what you'll get when you print. With the mouse, you can execute commands, highlight cells or ranges, open dialog boxes, place and size graphs, change type styles, fonts and point sizes. All with unparalleled speed and ease.

Lotus 1-2-3 Release 2.3 runs smoothly and quickly no matter what hardware you're running it on.

What's more, Release 2.3 gives you a wide range of printing and reporting capabilities. Including the capacity to place as many live graphs on a worksheet as you'd like.

Along with 96 type style combinations, new 3D-effect graphs, drawing and annotation tools, and the most font support, choices of colors and shading available.

Compatibility? As with any 1-2-3 product, it's no problem. Because Release 2.3 will read all of the files you've created on previous versions of 1-2-3, including files you've formatted using Allways™ and Impress.™ So you'll preserve all your work, as well as your training.

For more information about the new Release 2.3 or for upgrade details, call us today at **1-800-TRADE-UP, ext. 1112.**

What's New In Lotus 1-2-3 Release 2.3.

- A WYSIWYG graphical environment with live on-screen formatting
- Lotus Magellan viewer technology for fast file previewing, retrieving and linking...all without leaving your active worksheet
- More graph types, including 3D-effect graphs and graph annotation capabilities
- Auto Compress, for a trouble-free way of making larger worksheets print on single page
- Dialog Boxes for an easier, more interactive way of working
- Text-editing for easy on-sheet word processing, including automatic word wrap, even around graphs
- The Auditor for documenting or highlighting your spreadsheet logic
- Improved memory management for building larger worksheets up to 12 MB in size
- New printer drivers that support all leading laser and dot-matrix printers
- Context-sensitive Help and an interactive tutorial

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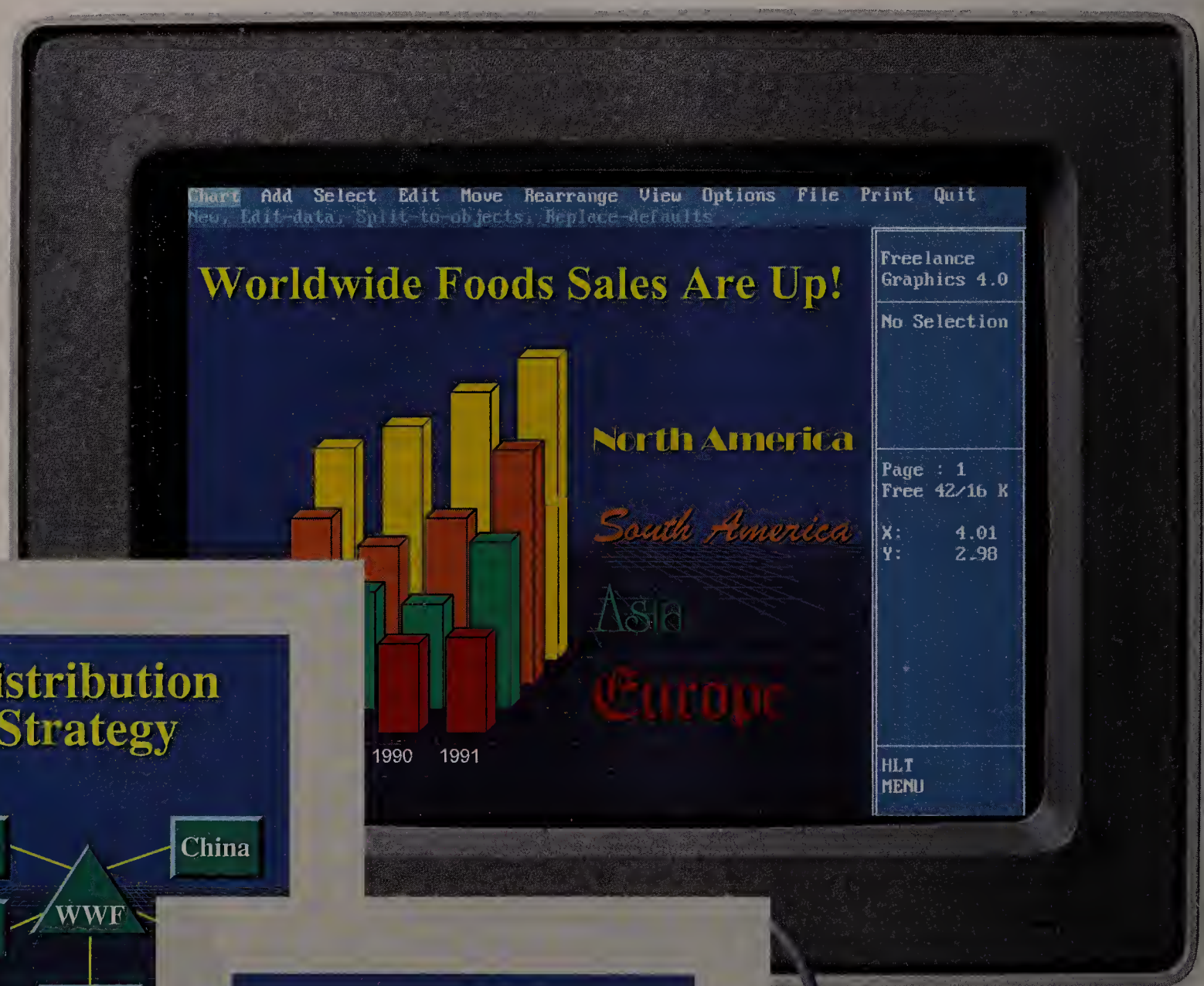
The new Lotus 1-2-3 for DOS

Lotus

Introducing the new
It will create your next
Not to mention



Automated Smart Features *make it easier than ever to produce everything from simple word charts to impressive flow charts, diagrams and other business drawings.*

The new Freelance Graphics for DOS offers a WYSIWYG (what-you-see-is-what-you-get) environment where you work with actual colors and fonts while you're creating your graphics. And with the mouse you can do it all in record time.

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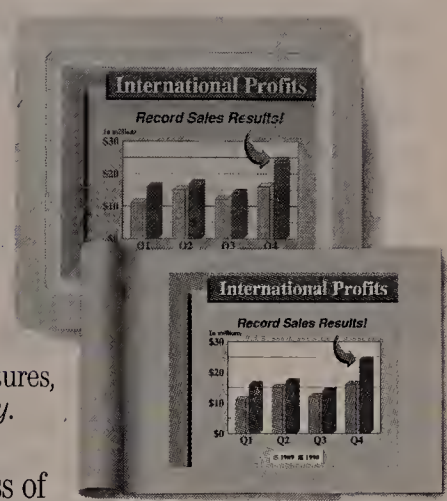
Freelance Graphics. presentation beautifully. automatically.

Now there's an even better version of Freelance® Plus, the award-winning graphics program praised by *PC Magazine, PC World* and *Software Digest.* It's so improved, in fact, we even changed its name. Introducing Freelance Graphics™ 4.0. The best presentation graphics program for DOS.

For starters, we've added a graphical WYSIWYG environment. Which means you'll work with actual colors and fonts while creating your graphics. Plus, you'll know what your output will look like before you print.



Only Freelance Graphics, with its unique automated Smart Features, *can turn your rough ideas into a smooth presentation this easily.*

For two consecutive years, Software Digest *awarded Freelance Plus its highest-rating. Now with Freelance Graphics, we've made the best even better.*

And with the mouse you'll do it all—from executing menu commands to moving a chart—in record time.

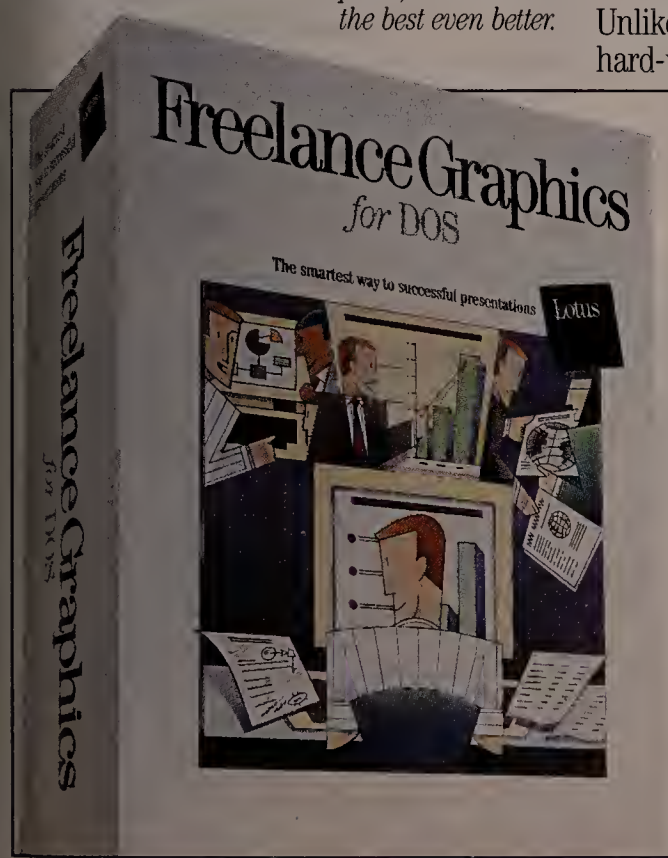
Yet what's really unique about the new Freelance Graphics is its *Smart Features.* Unlike other DOS graphics programs, its hard-working *Smart Features* automate the process of turning your ideas into persuasive presentations. So while you're concentrating on what you want to say, Freelance Graphics will take care of how it looks. Whether you're creating slides, overheads, or hard copy, in color or black-and-white.

Here are a few of its *Smart Features:* Portfolio, a built-in presentation manager, helps you organize and prepare your presentation; a Text Chart Outliner,[1] complete with a spell-checker, creates stacks of text charts in seconds; Auto-charting makes weekly or monthly reporting a snap by printing hundreds of up-to-date charts with a single command; Smart Chart Update automatically recomposes a chart whenever the data changes... even if you've added annotations or symbols; and over 1,000 Pre-drawn Symbols and Design Backgrounds.

All of which means you can now create an incredibly impressive presentation. With incredible speed and ease.

The new Freelance Graphics.

It could actually have you looking forward to your next presentation.



Upgrade to Freelance Graphics now and you won't just save time. You'll save money.

Right now we're offering—direct from Lotus®—a price of just $99.00[2] for anyone upgrading from an earlier version of Lotus Freelance or Graphwriter, or any other eligible[3] graphics program, including Harvard Graphics.

Plus, you'll be covered by the Lotus Technology Guarantee. Which means a guaranteed price of just $49.00 on our upcoming Freelance Graphics for Windows™ product.

For information or to purchase your upgrade directly from Lotus, call us.[4] Please have your credit card and eligible product package ready.

1-800-TRADE UP ext. 1100.

[1]*Developed by Symantec Corporation, especially for Freelance Graphics.* [2]*Offer expires September 30, 1991, after which the Lotus direct upgrade price will be $119.* [3]*Eligible products for upgrade offer include all versions of the following products: Lotus Freelance Plus or Graphwriter, Harvard Graphics, DrawPerfect, Applause II/Draw Applause, Graph Plus, Charisma, Microsoft Chart, Pixie, Gem Series, ChartMaster, Diagram Master.* [4]*Freelance Graphics Upgrade also available at participating Lotus resellers.*

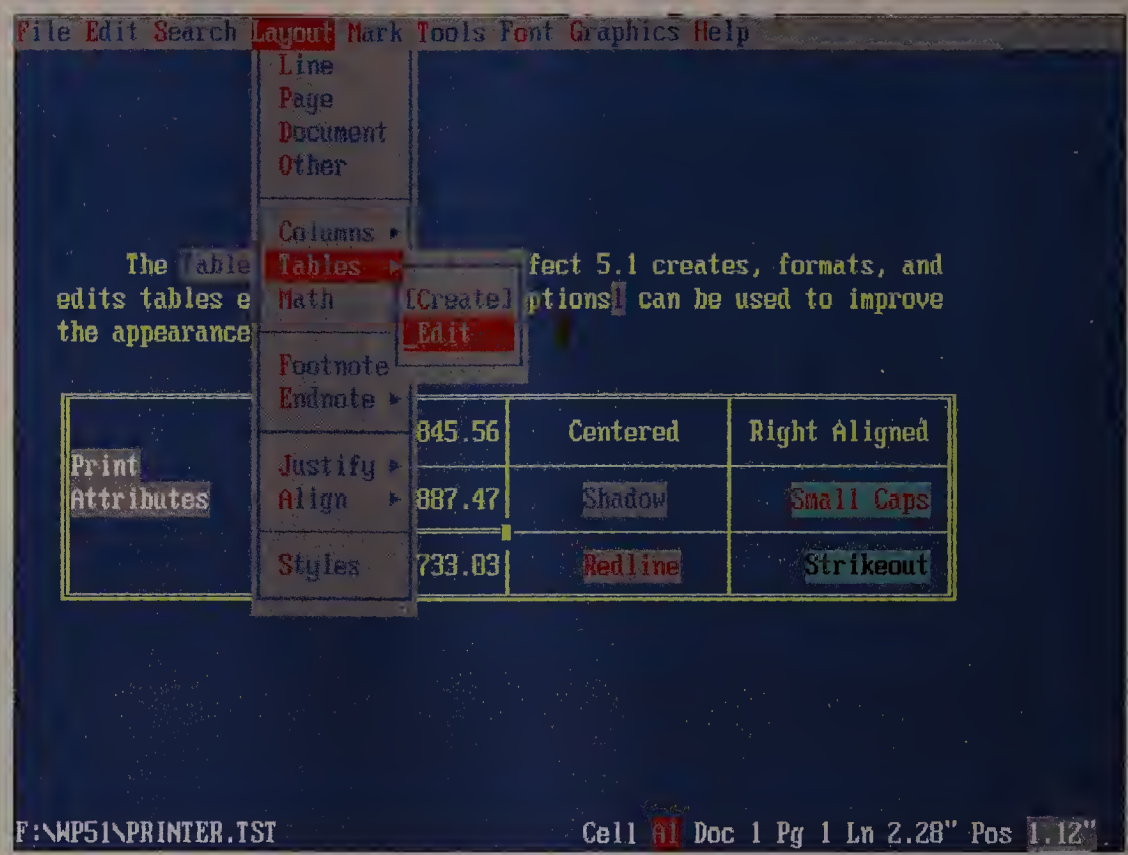
Freelance Graphics for DOS

Lotus

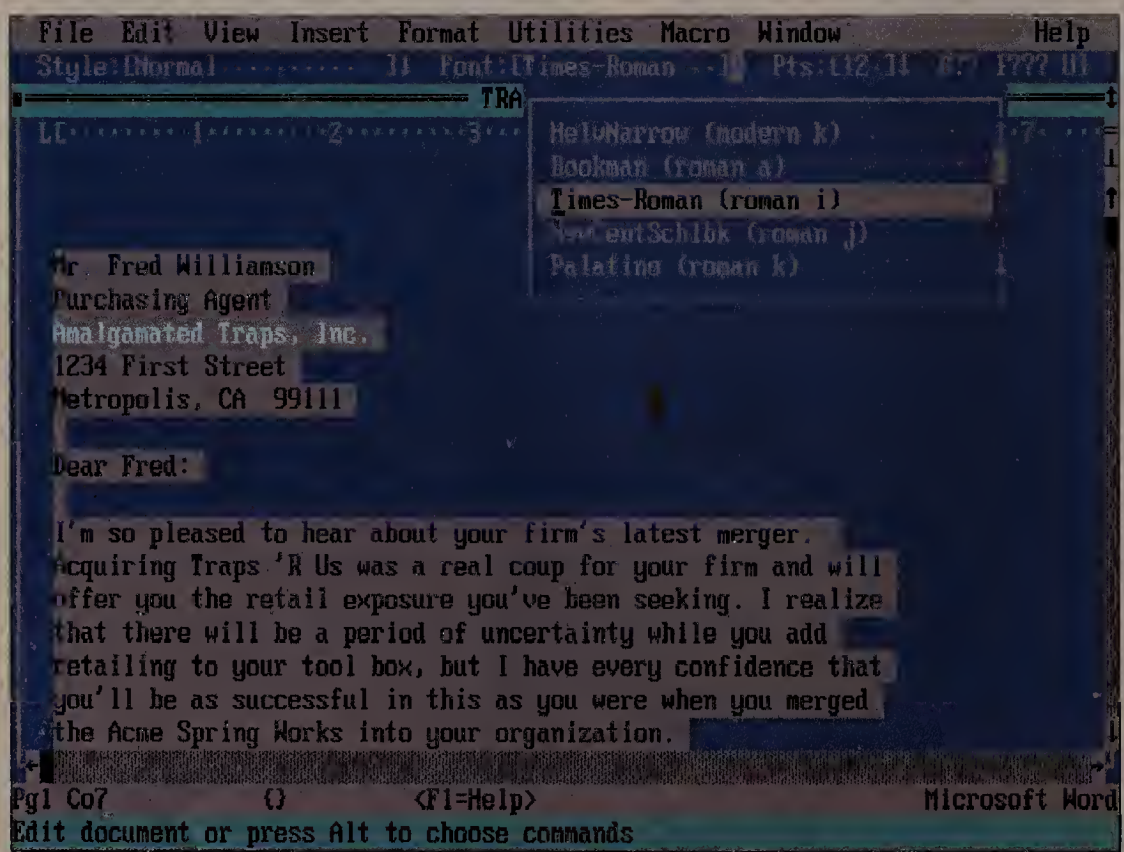
With version 5.1's pulldown menus and mouse support, previously buried tools become more accessible: Improved ease of use is apparent in everything from editing, where the mouse supplements cumbersome block-marking commands, to complex formatting operations. Yet once new users get past the first layer of the optional pulldown menus, they may puzzle over the less-than-intuitive dialog screens. Other annoyances: You can split the screen, but you can't load the same document into both parts. Also, *WordPerfect* still pushes text off the screen when you insert words, waiting until you move the cursor up or down before it reformats.

Bountiful formatting features include adjustable-width columns and graphics integration. Group workers will profit from top-notch redlining tools, plus a convenient tool for assembling long documents from individual files. *WordPerfect* is the only DOS-based package to offer both equation and table editors—the latter makes it easy to spice up imported spreadsheets with lines and shading. The program's custom keyboards aren't available in *Word 5.5*, and there's an excellent spelling checker. The extensive macro language, unlike *Word 5.5*'s, doesn't let you edit macros as text.

Thanks to its exhaustive feature set and superb technical support, *WordPerfect 5.1* is an excellent value. But *Word 5.5*'s simpler interface gives it the edge for most users.



WordPerfect 5.1's pulldown menus make it far easier to access once-buried features. The new table editor lets you add shading and lines to imported spreadsheets and text tables.



Bringing Word for Windows interface innovations into the character-based world, Best Buy Word 5.5 makes font selection just a mouse click away.

WordStar 6.0

PROS: Fast editing, multipage preview, outliner, telecommunications and data management modules

CONS: Difficult formatting, no mouse support, weak macros, poor graphics integration

Like *MultiMate*, *WordStar 6.0* has its roots deep in the past. Unlike *MultiMate*, it's relatively up-to-date, and it's a possibility if your formatting needs are slim and you're looking for a fast editor. Overall, however, *WordStar*'s primitive formatting interface makes it only a fair value.

WordStar's popularity is based on editing speed, especially for touch typists who hate taking their hands off the home row—most cursor movements and commands can be given with <Ctrl>-*key* combinations. One nice touch for professional writers: With a single command, you can write a block of text directly into a new file without having to open a window.

New users will appreciate pulldown menus, but the lack of either mouse support or single-key menu commands is frustrating. Marking or formatting a block requires a command at the begin-

How to get your life organized in 40 minutes, guaranteed.

(30 minutes if you skip ahead to the 800 number.)

That gives you ten minutes to read this ad. Probably the most luxurious deadline you've had in months.

Which is why you should buy new Lotus® Agenda® Release 2.0. It's the personal information manager for your PC or laptop that will help you get better control of information like appointments, personnel, figures, projects, stray thoughts and more, in only 30 minutes.

Just type it all in and Agenda sorts it out, grouping relevant information in an organized, easy-to-read format.

Choose from the ready-to-use starter applications, including the Activities Planner, People Manager, Account Manager or Information Sifter. Or customize applications for more specific needs. If it all sounds too good to be true, consider what these Agenda users have to say: "All of those notes, pads, and slips of paper that littered my desk are gone... I just put them into Agenda."

—Grant Tipler, Manager, Corporate Banking, Head Office, The Royal Bank of Canada

"The first program... that allows me to easily enter information, file it, and then use it." *—Corson Ellis III, President, Kessler-Ellis Products*

"The two most important things in management are follow-up and follow-through. Agenda is essential for both." *—Randy Fields, Chairman, Mrs. Fields, Inc.*

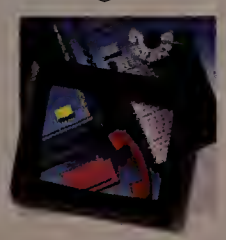
To see for yourself what Agenda can do, send someone to the nearest software store to buy it. We're so sure you'll like it, we back it with a 30-day money-back guarantee. Or, for a free demo disk, call **1-800-842-8455, extension 929.**

Finally, a word to everyone who read this ad all the way from the beginning.

Your ten minutes are about up. Get back to work.

Lotus Agenda 2.0 is so easy to work with, you'll start getting better control of your professional life within 30 minutes.

Lotus Agenda



Introducing New Lotus Agenda 2.0

PC WORLD PRODUCT OF THE YEAR 1990

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ning and end of each block. The editing screen is cluttered with control characters and confusing dot commands, which are required for most formatting tasks. Style sheets are limited, and you can use only one style per file. The page preview, however, is the best in the character-based group, letting you display several pages at a time.

Printer support is excellent, as is footnoting, and the mail merge matches *Word for Windows'* for top billing. But *WordStar* has no table editor, line drawing, or programmable macros.

WordStar ships with a lot of extras, but they're poorly integrated—each module has its own interface and command structure. To integrate graphics, you must turn to a separate add-on product, and there are no graphics conversions. A capable single-user flat-file data manager is helpful in mail merge, but the external telecommunications module lacks a dialing directory.

Loyal *WordStar* users with 286 or 8088 hardware will profit from an upgrade to version 6.0, but for everyone else, *Word 5.5* or *WordPerfect 5.1* makes more sense.

More Windows On the Horizon

How do you know if *Windows* makes sense for you? If everyone used *Windows 3.0* on a suitable platform, the answer would be simple. Most users who try *Ami Pro* or *Word for Windows* like what they see: Their documents look better, and complicated formatting jobs such as setting fonts go much faster.

Best Buy *Ami Pro* is ideal for most *Windows* users, especially those who work with graphics. *Word 5.5*'s easy new interface and powerful tools make it a Best Buy if you prefer (or are stuck with) plain old DOS.

Our two runners-up, *Word for Windows* and *WordPerfect*, came quite close to winning Best Buys. *Word for Windows* beats out *Ami Pro* if group editing and customization are crucial, and *WordPerfect* bests *Word* for users who need to integrate tables or organize long documents.

If you don't find your dream word processor here, hot new packages are on the way. Soon after you read this, *WordPerfect for Windows* should be shipping, as well as a *Windows* product from Symantec. Later this year, you can look for a *Windows* version of IBM's *Signature*. Based on *XyWrite* (and replacing *DisplayWrite*), the DOS-based *Signature* should be shipping when you read this. The latest trend is the spin-off: Software Publishing has weighed in with *Professional Write Plus for Windows*, which is based on *Ami Pro*, and *WordStar for Windows* will be shipping later this year.

The word processing market is clearly heating up again after years of stability. And almost all the action is happening with *Windows*.

George Campbell, who writes the column Words into Print, *is a contributing editor for* PC World.

For more information about all products in this article, circle reader service no. 902.

WHERE TO BUY

Ami Pro 1.2
Lotus Development Corp.
Word Processing Division
5600 Glenridge Dr. #300
Atlanta, GA 30342
800/831-9679
LIST PRICE: $495; $199 for network nodes
REQUIREMENTS: AT or compatible, 1MB RAM, DOS 3.1 or later version, hard disk, graphics, Windows 2.x or later version
TECHNICAL SUPPORT: unlimited, toll number, M–F 8–7
OTHER SUPPORT: CompuServe, fax support, corporate extended support
Reader service no. 609

Legacy 1.1
NBI, Inc.
3375 Mitchell Ln.
P.O. Box 9001
Boulder, CO 80301
800/624-1111
LIST PRICE: $495
REQUIREMENTS: AT or compatible, 1MB RAM, DOS 3.2 or later version, hard disk, graphics, Windows 3.0
TECHNICAL SUPPORT: unlimited, toll-free, M–F 7–5
OTHER SUPPORT: CompuServe, fax support
Reader service no. 610

Microsoft Word 5.5
Microsoft Corp.
One Microsoft Way
Redmond, WA 98052-6399
800/426-9400
LIST PRICE: $450, upgrade from 5.0 $50
REQUIREMENTS: 384K RAM, DOS 2.0 or later version, two floppy drives or hard disk
TECHNICAL SUPPORT: unlimited, toll number, M–F 6–6
OTHER SUPPORT: BBS, CompuServe, GEnie, corporate extended support
Reader service no. 611

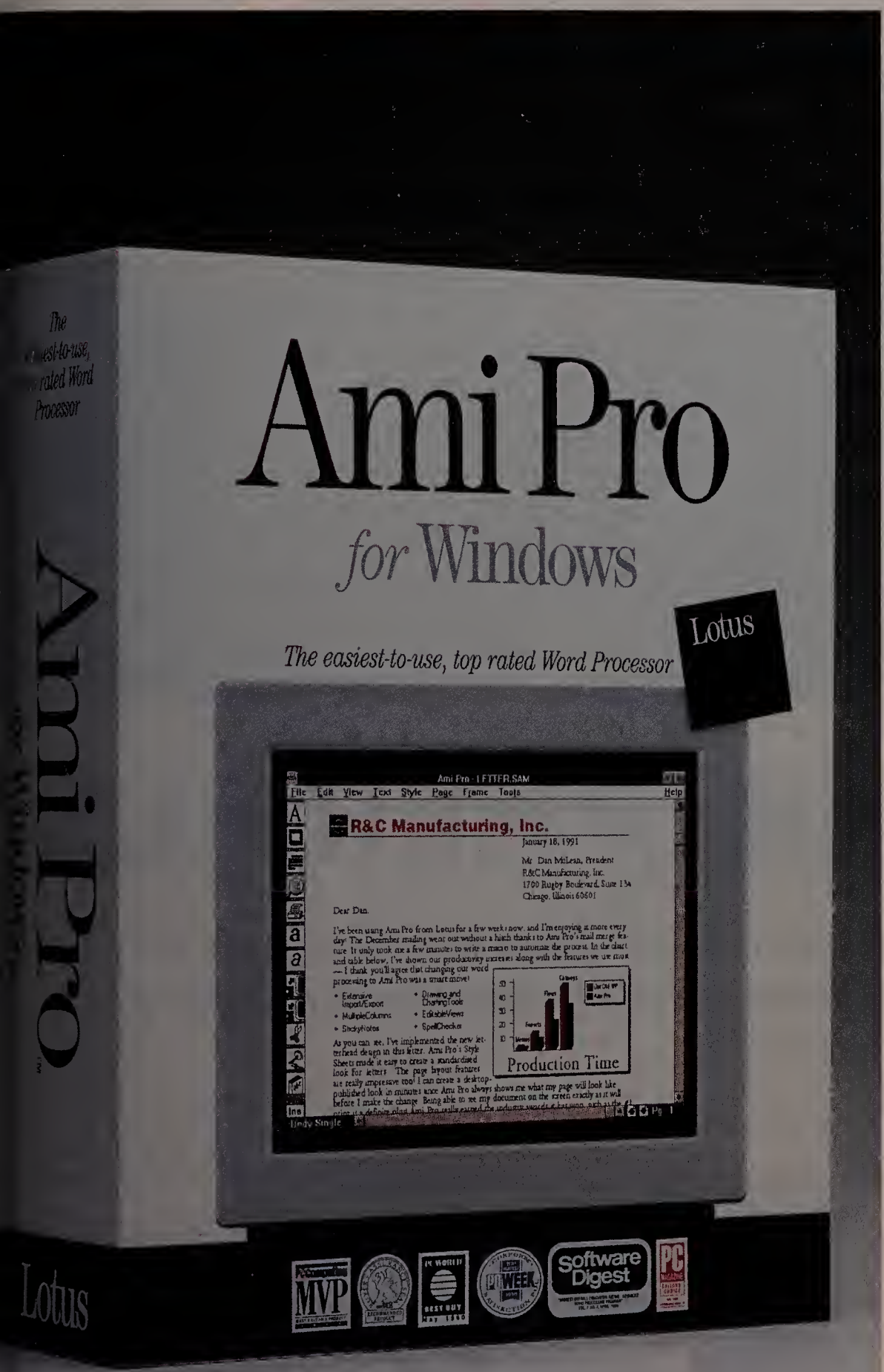
Microsoft Word for Windows 1.1
LIST PRICE: $495
REQUIREMENTS: AT or better, 1MB RAM, DOS 3.1 or later version, hard disk, graphics, Windows 3.0
TECHNICAL SUPPORT: unlimited, toll number, M–F 6–6
OTHER SUPPORT: BBS, CompuServe, GEnie, fax support, corporate extended support
Reader service no. 612

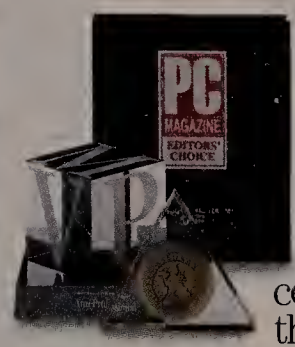
MultiMate 4.0
Ashton-Tate Corp.
20101 Hamilton Ave.
Torrance, CA 90509-9972
800/227-4866
LIST PRICE: $495
REQUIREMENTS: 384K RAM, DOS 3.1 or later version, hard disk
TECHNICAL SUPPORT: unlimited, toll number, M–W, F 6–4:30, Th 6–4
OTHER SUPPORT: CompuServe, fax support
Reader service no. 613

WordPerfect 5.1
WordPerfect Corp.
1555 N. Technology Way
Orem, UT 84057
801/225-5000
LIST PRICE: $495
REQUIREMENTS: 384K RAM, DOS 2.0 or later version, two 720K floppy drives or hard disk
TECHNICAL SUPPORT: unlimited, toll-free number, M–F 7–6
OTHER SUPPORT: BBS, CompuServe, fax support, corporate extended support
Reader service no. 614

WordStar 6.0
WordStar Int'l
201 Alameda del Prado
Novato, CA 94949
800/227-5609
LIST PRICE: $495
REQUIREMENTS: 384K RAM, DOS 2.0 or later version, two floppy drives or hard disk
TECHNICAL SUPPORT: unlimited, toll number, M–F 7–4
OTHER SUPPORT: CompuServe, fax support, corporate extended support
Reader service no. 615

Pick a winner.





Try Ami Pro™ from Lotus just once and you'll see why its the only word processor for Windows™ that's winning it all . . . praise from experts and raves from users.

Designed to take full advantage of the Windows™ environment, Ami Pro combines power word processing with the power to create professional documents. And with its icons and interactive features, it's incredibly easy to learn and use.

No wonder Ami Pro has received top ratings from virtually all the industry experts, winning such coveted awards as PC World's Best Buy, The Buyer's Assurance Seal from InfoWorld and PC Magazine's Editor's Choice.

But that's not all. In a recent independent survey* users ranked Ami Pro "Best Overall" at a rate of *more than two to one* over Word for Windows and WordPerfect® for DOS.

Independent User Survey For Windows.™*			
Word Processing Features	Ami Pro *for Windows*	Word for Windows	WordPerfect for DOS
Best Overall	50%	22%	16%
Ease of Learning	47%	28%	8%
Ease of Use	52%	23%	8%

If you're ready to see first-hand what word processing for Windows is all about, call our toll free number, for a free working model of Ami Pro. Then go ahead and pick a winner. **Call 1-800-831-9679 (In Canada 1-800-668-1509.)**

Ami Pro *for Windows*
from
Lotus®

Word Processing Division, 5600 Glenridge Drive, Atlanta, GA 30342, 404-851-0007/1-800-831-9679

*Independently conducted Windows word processing Usage & Attitude Study, November, 1990. Figures cited are among Word for Windows users that are also users or triers of Ami Pro.

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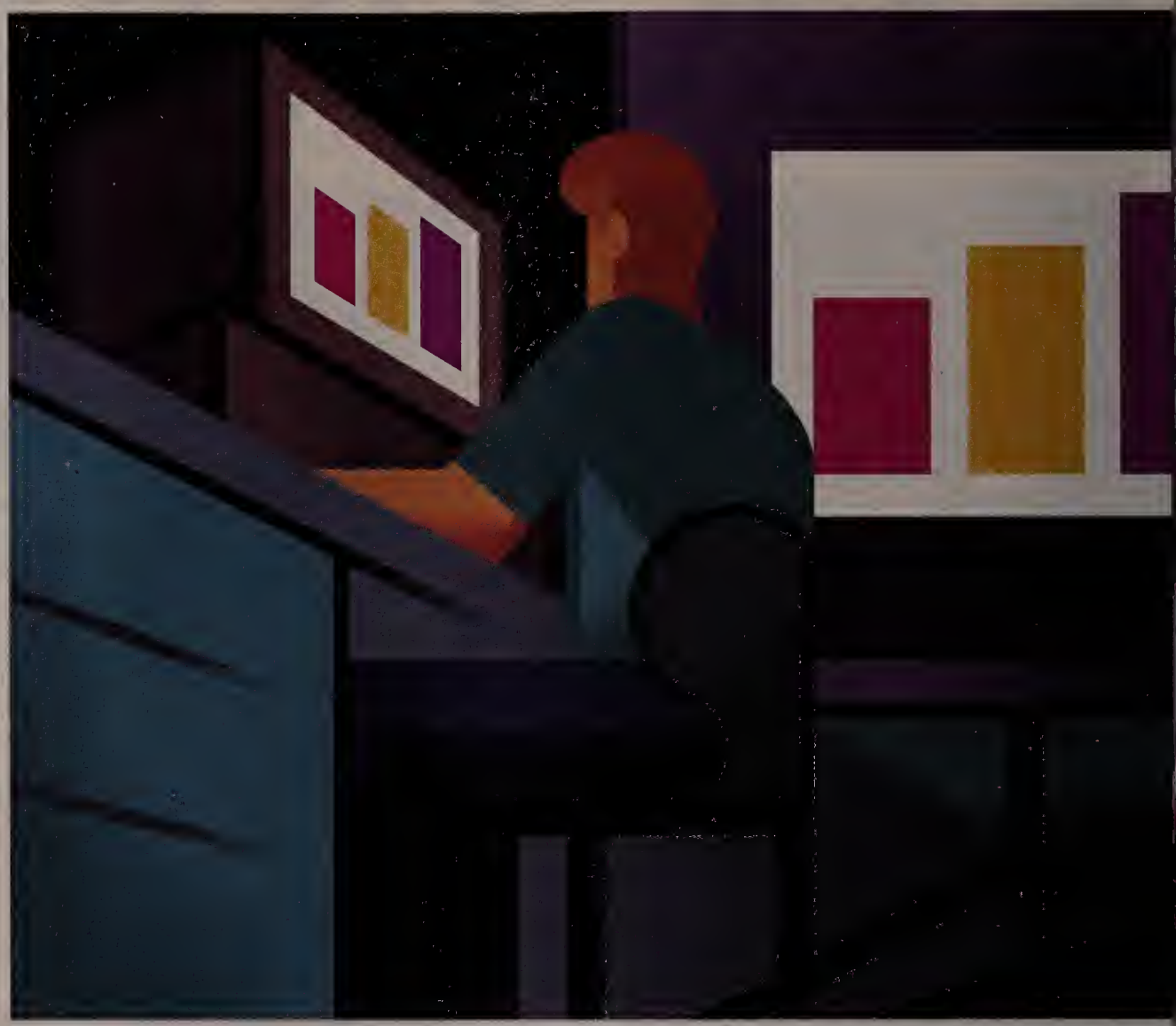
Circle 324 on reader service card

COLOR PERIPHERALS



RON CHAN

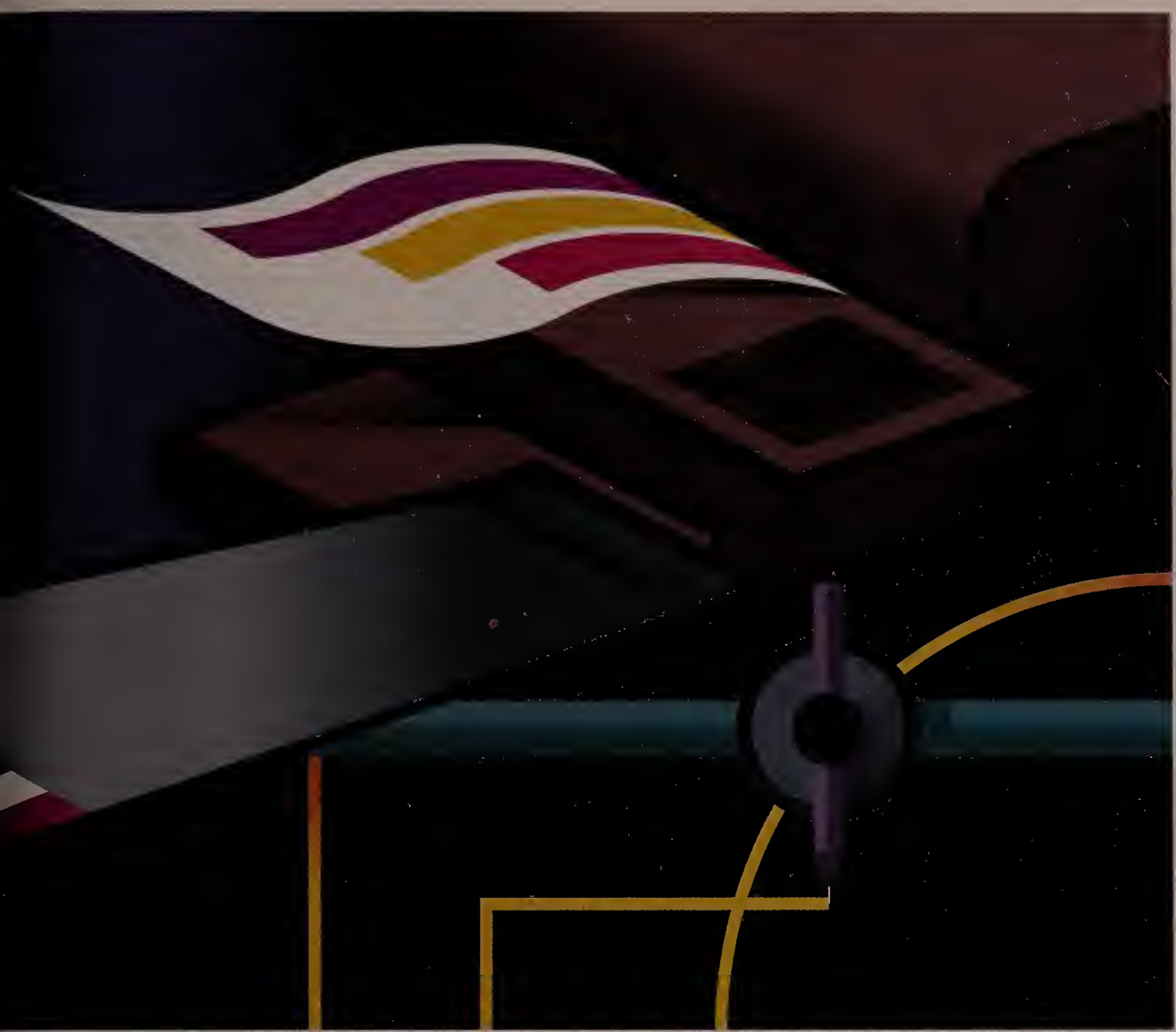
Isn't it time you showed your true colors? Take your pick of over 100 color scanners, plotters, printers, and film recorders, and produce unforgettable documents and presentations.

COVER STORY

Climbing the ladder of success sometimes means showing off your fancy footwork in public. Whether you need pie charts for a weekly sales report, overhead transparencies for a board meeting, or state-of-the-art 35mm slides to wow a big audience, color output gives you a leg up on the competition. Your information is easier to understand, your presentation more memorable.

The cost of color input and output devices has dropped low enough to make them viable presentation tools. Affordable color is here now—and savvy business users will be colorizing their presentations faster than you can say Ted Turner.

Bob Weibel and Daniel Tynan



To help you move from the shadows of PC noir into the wonderful world of color, we've put together this comprehensive guide to color scanners, printers, plotters, and 35mm slide recorders—from $300 dot matrix models to $10,000 film machines. Along the way we'll discuss how you can use color, what features to look for, and some of the hidden costs.

LIGHTS, COLOR, ACTION

The kind of color devices you buy depends on what you want to produce and how much you want to spend. For simplicity's sake, we've divided the common uses of PC color into primary business applications (in-house documents and professional presentations) and secondary uses (proofing and technical printing).

In-House Documents A little color can go a long way toward making the sales figures in a printed pie chart crystal clear or sparking up a report or newsletter. If your documents and presentations are meant for in-house use, you don't need top-of-the-line colors or graphics capabilities, so you don't need to spend a lot of money. Dot matrix and ink jet printers and low-cost plotters give you spot-color printouts and transparencies for $300 to $3000.

Pro Presentations Short of mass hypnosis, the most effective way to mesmerize an audience is to make your pitch in color. Low-resolution text and graphics look scraggly and crude when projected as 35mm slides or overhead transparencies. Presentation Svengalis need the smoothest possible output and are willing to spend more to get it. For around $2000, a color scanner lets you capture photographic-quality images, add text and graphics, and use the enhanced images in 35mm slide shows. When there's a call to print full-color transparencies—or color flip charts for one-on-one presentations—smart users turn to 300-dot-per-inch (dpi) thermal wax printers, which start at around $5000.

Proofing Somewhere in your organization, someone is designing sales brochures, product packaging, or marketing hit pieces. PostScript-based thermal wax printers let you look at a *proof*, or full-color sample, of the design before giving the OK for final production. You'll save money by making corrections in-house instead of at the print shop, and you'll be happier with the final product.

Technical Printing Engineers and architects need color for creating complex schematics and diagrams but require greater precision and larger paper formats than the average business user. Color plotters deliver both. But for sophisticated tasks like thermal analyses and 3-D modeling, you'll need the broader spectrum of colors offered by thermal wax devices.

ADVENTURES IN THE SCAN TRADE

Clip art and computer-generated charts are great cures for business users suffering from art failure. But sometimes presentations demand real-world images, such as photos of your company's products or personnel, and for that you'll need a color scanner. Our table lists 24 models—hand-held units, desktop machines, and 35mm slide scanners.

Remember, at this price level, scanned images can't match the quality of the original. To gauge quality, look at specs like maximum resolution (page scanners range from 75 dpi to 900 dpi, with 300 dpi being typical) and the number of colors you can capture (from a scant 64 per image to a full 16,777,216). More important, try a hands-on investigation. Use the scanner's software to zoom in and examine scanned images pixel by pixel. The images should be free of flaws, with different color dots properly aligned along the edge. Consistency is key: If the colors for the same image vary from scan to scan, you may have to spend a lot of time futzing with images to get them right.

Color-image files can be monstrous—as big as 30MB for a full-color page at 300 dpi—but you can decrease file size by scaling down the resolution. (For example, 72 dpi is fine for on-screen display and most print jobs.) Look for flexible resolution controls and a good set of image editing tools—preferably *Windows* based for easy file transfer. The software must save images in a format your applications can

COLOR SCANNERS

Manufacturer	Product	Price	Resolution (dpi)	Maximum colors	Maximum scan size (inches)	Windows-based image editor	FILE FORMATS SUPPORTED: Color TIFF	PCX	EPS	Warranty	Reader service number
HAND-HELD											
A4TECH	A4Color Scanner	$699	90–270	256	7.5 x 5.5	N	Y	Y	N	1 year	707
DFI	CHS-4000	$695	100–400	64	4 x 20[1]	N	Y	Y	N	1 year	708
KYE INT'L	GS-C105 Plus	$799	100–400	4096	8.5 x 14[1]	Y	Y	Y	Y	1 year	709
MARSTEK	ColorArtist	$695	50–200	262,144	8.5 x 11[1]	Y	Y	Y	N	1 year	710
MOUSE SYSTEMS	Pagebrush/Color/PC	$799	100–400	4096	8.5 x 11[1]	Y	Y	Y	N	2 years	711
NCL AMERICA	Clearscan Color	$695	100–400	4096	8.5 x 14[1]	N	Y	Y	N	1 year	712
DESKTOP											
AVR	AVR 3000/CL Plus	$2590	12–300	16.8M	8.5 x 14	Y	Y	N	Y	1 year	713
CHINON AMERICA	DS-3000[2]	$995	75	4096	8.5 x 11	Y	Y	Y	N	1 year	714
EPSON AMERICA	Epson ES-300C	$2494	50–600	16.8M	8.5 x 11.7	Y	Y	Y	Y	1 year	715
HOWTEK	Personal Color Scanner	$2295	50–300	16.8M	8.5 x 14	Y	Y	Y	N	1 year	716
	Scanmaster 3	$8195	75–400	16.8M	11.7 x 17	Y	Y	Y	N	90 days	716
MICROTEK LAB	MSF-300Z	$2695	75–300	16.8M	8.5 x 14	Y	Y	Y	Y	1 year	717
	ScanMaker 600Z	$1995	75–600	16.8M	8.5 x 14	Y	Y	Y	Y	1 year	717
NISCA	Spectra for the PC[3]	$899	50–400	16.8M	4 x 6	Y	Y	Y	Y	1 year	718
OBM	ProScan PS-3000	$995[4]	75–300	16.8M	8.5 x 14	Y	Y	N	Y	1 year	719
SHARP ELECTRONICS	JX-100[3]	$995	200	262,144	4 x 6	N	Y	Y	N	90 days	720
	JX-300	$2345	75–300	16.8M	8.5 x 11	Y	Y	Y	N	90 days	720
	JX-450	$5995	75–300	16.8M	11 x 17[5]	Y	Y	Y	N	90 days	720
UMAX	UC300	$2495	1–300	16.8M	8.5 x 14	Y	Y	Y	Y	1 year	721
XRS	OmniMedia 3c[6]	$4500	75–300	16.8M	8.5 x 14	Y	Y	Y	Y	1 year	722
35mm SLIDE SCANNERS											
BARNEYSCAN	CIS-3515	$4495	1000	16.8M	35mm	N	Y	Y	Y	90 days	723
HOWTEK	Scanmaster 35 Plus	$5795	1333[7]	16.8M	35mm	Y	Y	Y	N	90 days	724
MICROTEK LAB	ScanMaker 1850	$2995	462–1850	16.8M	35mm	Y	Y	Y	Y	1 year	725
NIKON, INC.	LS-3500	$10,495	4400[8]	16.8M	35mm	Y	Y	Y	N	1 year	726

[1] Large images require multiple passes with scanner.
[2] Converts gray-scale image to color via software.
[3] Small format (4-by-6-inch) scanner.
[4] Micro Channel–compatible scanner $1045.
[5] 35mm slide scanner attachment costs $500.
[6] X-ray and transparency scanner; 3cx scanner with higher dynamic range costs $5400.
[7] Or 1333 x 2000 screen pixels.
[8] 6144 x 4096 screen pixels.

For more information about all products in this table, circle reader service no. 908.

accept, such as TIFF or PCX, or EPS if you plan to output scans directly to a PostScript device. Finally, consider the size and type of originals the unit can handle, especially if you scan glossy photos or transparencies.

Hand-Held Scanners

A hand scanner is like a Dustbuster—it's good for small jobs in tight corners, but you wouldn't want to do a whole room with one. At $700 to $1000, a hand-held scanner is the cheapest way to capture color images, good for on-screen slide shows. But hand scanners are limited in the number of colors and size of image they can capture, and they require a slow and steady hand for properly aligned images. If the image is wider than the scan head (typically 2½ to 4 inches), you'll have to make two or more passes and stitch the image together via software. Look for models that let you scan full-size images and adjust resolution in increments of 50 dpi or less.

Desktop Scanners

If your presentations demand a steady diet of scanned images, do yourself a favor and fork out $2000 or more for a full-page 300-dpi scanner. Desktop scanners present none of the alignment problems of hand-held units—just place the image on the glass, like on a photocopier—and they usually handle originals up to 8½ by 14 inches. Most also let you capture 8-bit (256 colors or gray shades) and 24-bit (16.8 million colors) images.

Do you *really* need 16 million colors? In most cases, the answer is no. Unless you have an expensive 24-bit video board, you won't be able to see more than 256 colors on screen. The difference comes when you want to create 35mm slides: 24-bit color helps to create smooth gradients (where one shade blends gradually into another) and simulate continuous color tones.

Look for scanner software that lets you specify resolution in fine increments (from 1 to 15 dpi) to fit your output device. Finally, since the unit will be sharing your desktop, consider factors like size, noise of operation, and how easy it is to place bulky items like books on the scanner.

35mm Slide Scanners

Simply put, slide scanners take digitized photos of 35mm slides, which are generally of higher quality than photographs. At $3000 to $10,000,

they'll burn a bigger hole in your budget than most full-page scanners, but they produce more accurate colors. If you need to import images from an existing slide library or scan the highest-quality originals, slide scanners are a good investment. All the models listed in the table capture 24-bit images, and most come with powerful *Windows*-based image editors. Look for a scanner that lets you select resolution and final image size from a quick preview scan and that doesn't require a special add-on board or monitor.

COLOR OUTPUT: THE PROOF IS IN THE PRINTING

Epson LQ-2550

HP PaintJet XL

Tektronix Phaser II PX

Compared to 2400-dpi Linotronic output (left), dot matrix and ink jet units create coarse images with visible interference patterns; thermals produce smoother color gradations.

HUES YOU CAN USE

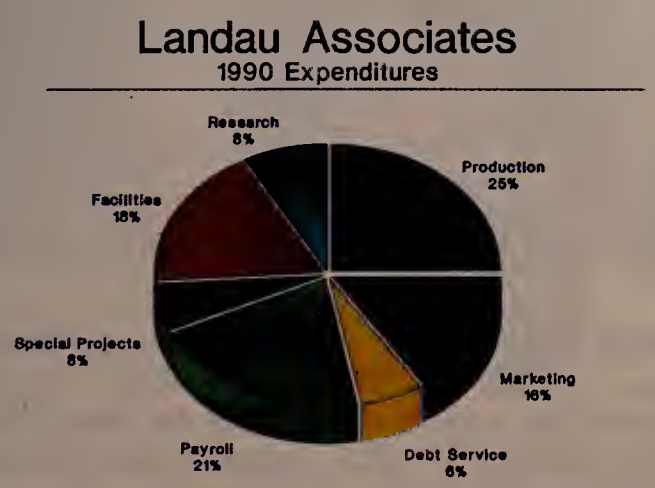
It's no good dressing up your color images if they've got nowhere to go. You need a color output device that gives you the right quality for the job, whether it's a down-and-dirty office newsletter or a high-powered presentation. Fortunately, you're not hurting for options. We've selected 46 machines—including dot matrix, ink jet, and thermal wax units—that let you print all the colors of the rainbow.

The key to buying a color printer is finding the right balance between output quality and cost. Quality varies depending on the device's resolution and color range and the type of media it prints on. Examine output samples printed on the kind of paper or film you plan to use. Top-notch color units produce smooth color gradients, solid colors free from *banding* (horizontal or vertical streaks), and minimal *moiré effects* (interference patterns that appear when color dots overlap at odd angles).

Besides the initial purchase price, give thought to cost per page. You should also consider paper types and sizes, built-in fonts, and the ability to add typefaces via downloading or cartridges. Speed is less of a consideration; at this price range, all color devices are slow. If you want to print more than a handful of color pages, you'll save time by printing out one original and using a color copier to produce the rest.

Finally, be prepared for some surprises at print time. Some screen colors can't be reproduced by printers—and vice versa—and colors vary depending on the monitor and printer. At press time Hewlett-Packard announced a *Windows 3.0* driver for its PaintJet printer that matches screen and page colors, but industrywide color standards are probably at least a year away.

PLOTTER CHARTS AS EASY AS PIE



Color pen plotters such as HP's 7550 Plus can generate sharp-looking overheads with just a handful of colors.

Dot Matrix

Color printing just doesn't get any cheaper than with dot matrix printers, which run from $300 to $2700 per unit and cost you less than a penny per page. Many (such as Citizen's $499 GSX-140) are simply monochrome printers with a color upgrade kit—plug-in circuitry and a multicolored ribbon (typically red, yellow, blue, and black). The printer combines these colors to produce seven solid shades, though software drivers can simulate more by *dithering* (alternating colored dots).

Dot matrix units handle almost any kind of paper, but quality suffers with large blocks of solid shades; full-page graphics and transparencies are not recommended. Your typeface options are also limited, though some printers offer 80K or more RAM for downloaded fonts. Look for units that offer color dithering and print at a full 360 dpi for cleaner text and graphics.

Ink Jet

At $1400 to $2500 a pop, liquid ink jet printers cost more than most dot matrix units, but they deliver better quality. Most provide a color range comparable to that of pricey thermal transfer printers, though colors are less vivid. Still, they might be your best choice for paper handouts and reports—at 10 to 30 cents per page, they're far cheaper than thermals.

Ink jet printers can handle full-page graphics, if you're willing to wait 1½ to 4 minutes per page. You can use standard photocopier stock, but on paper with a high cotton content (such as quality letterhead), the ink tends to spread as it dries, producing fuzzy-looking text. Most vendors recommend specially coated stock to

COLOR PRINTERS

Manufacturer	Product	Price	RAM (standard/ maximum)	Rated speed	Resolution (dpi)	Maximum colors	EMULATIONS PostScript	HP-GL	Resident typefaces
DOT MATRIX									
ALPS AMERICA	ALQ224/gx	$799[3]	23K/256K	336 cps	360	7	N	N	5
CITIZEN AMERICA CORP.	GSX-145	$649	8K/40K	192 cps	360	7	N	N	6
	GSX-140	$499	8K/40K	192 cps	360	7	N	N	6
	200GX	$299	8K/40K	213 cps	240[6]	7	N	N	5
	HSP-500	$499	8K/40K	300 cps	240[6]	7	N	N	4
	HSP-550	$699	8K/40K	300 cps	240[6]	7	N	N	4
C-TECH ELECTRONICS	ProWriter C-610C+	$859	32K/32K	240 cps	360[7]	7	N	N	2
	ProWriter C-715A	$1499	32K/32K	300 cps	360[7]	7	N	N	2
EPSON AMERICA	Epson LQ-860	$949	6K/38K	300 cps	360	7	N	N	5
	Epson LQ-2550	$1499	8K/40K	500 cps	360	7	N	N	9
GENICOM	3410XCQ	$2704	2K/2K	400 cps	144	7	N	N	2
	1040	$1924	56K/56K	360 cps	360	7	N	N	1
NEC TECHNOLOGIES, INC.	Pinwriter P9300	$1395	80K/80K	400 cps	360	7	N	N	8
	Pinwriter P6200	$749	80K/80K	300 cps	360	7	N	N	8
	Pinwriter 6300	$999	80K/80K	300 cps	360	7	N	N	8
OKIDATA	Microline 393c+	$1599	23K/40K	520 cps	360	7	N	N	4
STAR MICRONICS AMERICA	XR-1500 Multi-Font	$699	32K/160K	300 cps	240[6]	7	N	N	9
	XR-1000 Multi-Font	$499	32K/160K	300 cps	240[6]	7	N	N	9
	NX-1020 Rainbow	$329	16K/16K	225 cps	240[6]	7	N	N	6
	XB-2415 Multi-Font	$899	41K/201K	240 cps	360	7	N	N	17
	XB-2410 Multi-Font	$699	27K/59K	240 cps	360	7	N	N	17
	NX-2420 Rainbow	$499	30K/62K	250 cps	360	7	N	N	7
INK JET									
DIGITAL EQUIPMENT CORP.	LJ 252	$1549	2K/2K	167 cps	180	255	N	N	1
EASTMAN KODAK	Diconix Color 4	$1495	64K/64K	150 cps	192	330	N	N	3
HEWLETT-PACKARD	HP PaintJet	$1395	5K/8K	167 cps	180	16.8M	N	N	3
	HP PaintJet XL	$2495	189K/189K	167 cps	180	16.8M	N	N	3
SHARP ELECTRONICS	JX-730	$2195	19K/19K	½ ppm	180	16.8M	N	N	1
TEKTRONIX	Colorquick	$2345	128K/128K	½ ppm	216	16.8M	N	N	1
THERMAL WAX									
CALCOMP	ColorMaster	$2999	1.5MB/1.5MB	1 ppm	200	16.8M	N	Y	2
	ColorMaster Plus 6603	$6995	6MB/6MB	1 ppm	300	16.8M	Y	Y	39
	ColorMaster Plus 6613	$9995	10MB/10MB	1 ppm	300	16.8M	Y	Y	39
GENERAL PARAMETRICS	Spectra-Star 410	$5995	1MB/1MB	1 ppm	300	16.8M	Y[10]	Y	35[10]
	Spectra-Star 420	$6595	4MB/4MB	1 ppm	300	16.8M	Y[10]	Y	35[10]
	Spectra-Star 430	$7995	6MB/6MB	1 ppm	300	16.8M	Y	Y	35
MITSUBISHI ELECTRONICS AMERICA	G650-10	$6995	0MB/0MB	1 ppm	300	262,000	N	N	21[11]
	G370-10	$5495	1MB/1MB	1 ppm	300	262,000	N	N	21[11]
NEC TECHNOLOGIES	Colormate PS 80	$8995	8MB/8MB	3 ppm	300	16.8M	Y	N	35
	Colormate PS 40	$6995	4MB/8MB	3 ppm	300	16.8M	Y	N	17
OCE GRAPHIC	G5241-PS	$8990	5MB/8MB	1 ppm	300	16.8M	Y	N	35
PANASONIC	EPL-8543	$7995	3MB/3MB	⅔ ppm	203	226,000	Y[12]	Y	35[12]
QMS	ColorScript Model 10	$8995	5MB/8MB	1 ppm	300	16.8M	Y	Y[12]	35
SEIKO INSTRUMENTS USA	ColorPoint PS 14	$9999	0MB/34MB	1 ppm	300	16.8M	Y	N	39
	ColorPoint PS 4	$6999	6MB/34MB	1 ppm	300	16.8M	Y	N	39
TEKTRONIX	Phaser II PX	$7995	6MB/10MB	1 ppm	300	11.39M	Y	Y	35
	Phaser II SX	$4995	1MB/5MB	1 ppm	300	11.39M	Y[12]	N	35[12]
XEROX-VERSATEC	Versacolor	$8995	16K/16K	⅔ ppm	300	250,000	Y[12]	N	35[12]

[1] A = 8.5" x 11" and 8.5" x 14", B = 11" x 17", C = 18" x 24"; ISO and DIN sizes not listed.
[2] P = parallel, S = serial.
[3] Wide-carriage model $999.
[4] Accepts continuous-form paper only.
[5] Serial port costs extra.
[6] 240 by 216 resolution.
[7] 360 by 180 resolution.
[8] On-site service optional.

For more information about all products in this table, circle reader service no. 911.

reduce ink saturation.

Ink jets will print transparencies, but due to their lower resolutions (180 to 216 dpi), projected text may appear jaggy, and colors aren't as dense as with thermals. (At press time, HP announced brighter inks for its PaintJet line.) Look for models that offer 24-bit color output for smoother gradients. Since resident typefaces are minimal, you'll want a unit that accepts downloaded fonts.

Thermal Wax

Thermals produce sharper text and brighter colors than liquid ink jets, but they will cost you. For printing color transparencies and glossy-paper flip charts, they can't be beat; just don't try to use plain paper stock.

Two years ago, thermal printers cost $10,000 or more; now you can buy models like Tektronix's Phaser II SX for $4995. Because thermals use

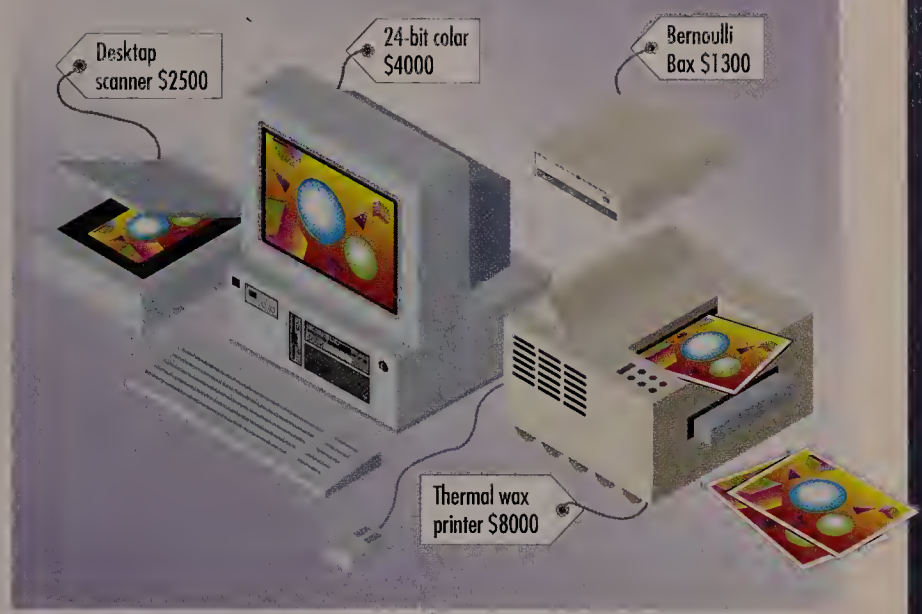
Accepts font cartridge/ downloaded fonts	Prints transpar-encies	Maximum paper capacity	Media sizes[1]	Ports[2]	Warranty	Reader service number
Y/Y	Y	100	A	P,S	1 year	743
N/Y	Y	n/a[4]	A	P,S[5]	2 years	744
N/Y	Y	n/a[4]	A	P,S[5]	2 years	744
N/Y	Y	n/a[4]	A	P,S[5]	2 years	744
N/Y	N	n/a[4]	A	P,S[5]	2 years	744
N/Y	Y	n/a[4]	A	P,S[5]	2 years	744
Y/Y	Y	100	A	P,S	2 years	745
Y/Y	Y	200	A,B	P,S	2 years	745
Y/Y	N	185	A	P,S	2 years	746
Y/Y	N	185	A	P,S	1 year	746
N/N	N	200	A	P,S	1 year	747
Y/Y	N	150	A	P,S	1 year	747
Y/N	Y	360	A,B	P,S[5]	1 year	748
Y/N	Y	360	A,B	P,S[5]	1 year	748
Y/N	Y	360	A,B	P,S[5]	1 year	748
Y/Y	Y	170	A,B	P,S	1 year	749
N/Y	N	120	A,B	P,S[5]	2 years	750
N/Y	N	120	A,B	P,S[5]	2 years	750
N/Y	N	120	A,B	P,S[5]	2 years	750
Y/Y	Y	120	A,B	P,S[5]	2 years	750
Y/Y	Y	120	A,B	P,S[5]	2 years	750
Y/Y	N	120	A,B	P,S[5]	2 years	750
N/N	Y	n/a[4]	A	P,S[5]	1 year	751
N/Y	Y	60	A	P	1 year	752
N/N	Y	n/a[4]	A	P,S	1 year	753
Y/Y	Y	200	A,B	P,S	1 year	753
N/N	Y	100	A,B	P	90 days	754
N/N	Y	100	A,B	P	90 days[8]	755
N/Y	Y	100	A	P,S	90 days	756
N/Y	Y	100	A	P,S	1 year[9]	756
N/Y	Y	100	A,B	P,S	1 year[9]	756
N/Y	Y	100	A	P,S	90 days[9]	757
N/Y	Y	100	A	P,S	90 days[9]	757
N/Y	Y	100	A	P,S	90 days[9]	757
N/N	Y	100	A,B	P	6 months	758
N/N	Y	100	A	P	6 months	758
N/Y	Y	100	A	P,S	1 year	759
N/Y	Y	100	A	P,S	1 year	759
N/Y	Y	100	A	P,S	1 year	760
N/Y	Y	100	A	P	1 year	761
N/Y	Y	100	A	P,S	1 year	762
N/Y	Y	80[4]	A,B	P,S	90 days[9]	763
N/Y	Y	145[4]	A	P,S	90 days[9]	763
N/Y	Y	100	A	P,S	1 year[8]	764
N/N	Y	100	A	P,S	1 year[8]	764
N/N	Y	250	A	P	90 days	765

[9] On-site service.
[10] Uses supplied PC-based PostScript software.
[11] Vio supplied SuperPrint utility.
[12] Requires extra-cost software utility.

specially coated paper and an expensive Mylar film coated with colored wax, their colors are richer than ink jets', but the cost per page is exorbitant—from 40 cents to $1.50. A full page of graphics prints in 1 to 2 minutes, and colors are usually smooth and vivid.

Most thermal units are PostScript printers, providing 35 or more scalable typefaces and top graphics capabilities. Others come with software-based PostScript interpreters like *Freedom of Press*—a cheaper but slower option. If you plan to print the final document on a high-resolution PostScript device such as a 1270-dpi Linotronic, you'll want a PostScript thermal printer to ensure accurate proofs. You'll also want at least 6MB of printer RAM for handling large images and downloaded fonts, plus the ability to print 24-bit color at a full 300 dpi for smooth color blends and crisp text. Some printers also let you reduce moiré patterns via software for fine-tuning full-page graphics.

THE HIDDEN COSTS OF COLOR



JEFF BERLIN

Moving into color is hardly a black-and-white proposition—how much you spend depends on the kind of jobs you need to do. If you need to edit full-color (24-bit) images or maintain a large image data base, you'll need a color system similar to the one shown above—a 386 with a $4000 24-bit color video board and monitor, $2500 desktop scanner, and $8000 thermal wax printer, plus a $1300 Bernoulli Box for storing and transporting large image files.

THE PLOTS THICKEN

Color pen plotters are literally robots that draw on paper with an array of colored pens. Though employed primarily for complex technical diagrams, any of the 33 plotters in our table can also produce high-quality text and simple charts.

A plotter's color options typically depend on the number of pens it can hold (usually eight). That's not enough for sophisticated images but is sufficient for many pie and bar charts. Since plotters don't come with built-in typefaces—and use their RAM for storing pages, not downloading fonts—you must specify fonts via software such as *Harvard Graphics*. Plotters draw text characters as if they were simple graphics, but they do so more smoothly than most 300-dpi printers, making them a fine choice for creating simple overheads.

The key to plotters is precision: The machine must be able to return to the exact point in a drawing where it started (*repeatability*) and draw lines of precise length (*accuracy*). Repeatability and accuracy measurements indicate relative margins of error—for example, a plotter with a .05mm accuracy rating might draw 10mm lines at 10.05mm. Resolution is also crucial—plotters that let you use (or address) smaller line seg-

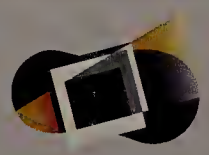
COLOR PEN PLOTTERS

Manufacturer	Product	Price	RAM (standard/ maximum)	Number of pens	Repeat-ability (mm/sec.)	Accuracy (mm)	Maximum accel-eration[1]	Resolution (address-able, in mm)	Media sizes[2]	Warranty	Reader service number
CALCOMP	Artisan Plus 1026M	$7995	1MB/3MB	8	.127	.25	2.8	.0125	A–E	1 year	733
HEWLETT-PACKARD	HP ColorPro	$1495	60K/1MB	8	.1	n/a[3]	1.2	.025	A	1 year	734
	HP 7475A	$1995	1MB/1MB	6	.1	n/a[3]	2	.025	A,C	1 year	734
	HP DraftPro	$3995	7.2K/7.2K	8	.1	.05	2.8	.025	C,D	1 year	734
	HP 7550 Plus	$3995	32K/2MB	8	.1	n/a[3]	6	.025	A,C	1 year	734
	HP DraftPro DXL	$4995	31K/2MB	8	.1	.5	2.8	.025	A–D	1 year	734
HOUSTON INSTRUMENT	HI Image Maker	$1195	1K/5K	8	.1	.1	n/a[3]	.025	A,C	1 year	735
	DMP-52	$3295	1K/7K	1	.05	.25	5.65	.025	A,C,D	90 days	735
	DMP-52 MP	$3895	1K/7K	14	.05	.25	5.65	.025	A,C,D	90 days	735
	DMP-61	$3995	16K/1MB	8	.05	.254	5.65	.025	A–D	1 year	735
	DMP-62	$5300	16K/1MB	8	.05	.254	2.8	.025	A–F	1 year	735
IOLINE CORP.	Ioline LP3500	$2995	14K/14K	1	.025	.063	.8	.025	A–D	1 year	736
	Ioline LP3700	$4195	14K/14K	8	.025	.063	.8	.025	A–E	1 year	736
	Ioline LP4000	$4995	4K/4K	8	.025	.025	2	.025	A–E	1 year	736
	Ioline Signature 5000	$5995	25K/25K	10	.025	.025	3	.025	A–E	1 year	736
JAPAN DIGITAL LABORATORY	JDL AutoPlotter XP	$3495	1.5MB/ 2.5MB	15/20[4]	.075	.075	n/a	.025	A–C	90 days	737
	JDL OmniPlotter	$6690	2MB/6MB	15/20[4]	.075	.075	n/a	.025	A–D	180 days	737
MUTOH AMERICA	iP530A	$4800	1MB/1MB	8	.001	.1%[5]	2.1	.025	A–D	1 year	738
	iP530AL	$6300	1MB/1MB	8	.001	.1%[5]	2.1	.025	A–E	1 year	738
	F-920A	$8900	1MB/1MB	8[6]	.1	.1%[5]	5.7	.01	A–E	1 year	738
OCÉ GRAPHIC	G1022	$1190	4K/4K	6	.150	.3%[5]	2	.025	A, B	1 year	739
	G1824-C	$4990	1MB/1MB	8	.1	.25	3	.01	A–E	1 year	739
	G1835-C	$6990	1MB/1MB	8	.1	.25	6	.01	A–E	1 year	739
ROLAND DIGITAL GROUP	SketchMate	$695	5K/5K	8	n/a[3]	n/a[3]	n/a[3]	.025	A	1 year	740
	DXY-1300	$1995	1MB/1MB	8	.1	.1	3	.025	A–C	1 year	740
	GRX-300AR	$4495	1MB/1MB	8	.1	.1	3	.025	A–D	1 year	740
	DPX-2500	$4995	1MB/1MB	8	.05	.1	3	.025	A–C	1 year	740
UNITED INNOVATIONS	Mural Flatbed Plotter	$2195	24K/88K	8	.025	.1%[5]	1	.025	A–C	1 year	741
ZETA GRAPHICS	ZETA 600	$4395	40K/1MB	8	.2	.01	4.2	.0025	A–E	90 days	742
	ZETA 912is	$4450	18K/18K	8	.1	.025	3	.0025	A,B	90 days	742
	ZETA 650	$6395	40K/1MB	8	.2	.01	4.2	.0025	A–E	90 days	742
	ZETA 924is	$6450	18K/18K	8	.1	.025	3	.0025	A–D	90 days	742
	ZETA 675	$7195	40K/1MB	8	.2	.01	4.2	.0025	A–E	90 days	742

[1] Measured diagonally in g's.
[2] Paper sizes: A = 8.5" x 11", B = 11" x 17", C = 18" x 24", D = 24" x 36", E = 36" x 48"; ISO and DIN sizes not included.
[3] Information not available from vendor.
[4] Dot matrix plotter emulates 15 pens (AutoPlotter) or 20 pens (OmniPlotter).
[5] Percent of distance moved by pen.
[6] Or 260 pencils.

For more information about all the products in this table, circle reader service no. 910.

DESKTOP SLIDE RECORDERS



Manufacturer	Product	Price	Instant camera	Maximum resolu-tion (lines)	Size of CRT (inches)[1]	Resident fonts (bit-mapped/ scalable)	PostScript compat-ible	APPLICATION SUPPORT: Win-dows 3.0	Harvard Graphics	Lotus Free-lance	FILE FORMATS SUPPORTED: Color TIFF	PCX	Warranty	Reader service number
AGFA	ProColor Film Recorder	$5495	$1095	4096	7	4/4	Y	Y	Y	Y	Y	Y	90 days	727
GCC TECHNOLOGIES	Colorfast	$5999	included	4096	3.5	2/2	N	Y	Y	Y	Y	N	2 years	728
LASERGRAPHICS	LFR	$8950	$1495	4000	6	8/1	Y	Y	Y	Y[2]	Y[2]	Y[2]	90 days	729
NISE, INC.	Rubens/XLT FR-900	$9995	$850	2048 x 1376[3]	7	0/0[4]	N	N	N	N	Y	N	90 days	730
POLAROID	Digital Palette CI-5000	$5995	included	4096	3.25	0/9	N[5]	Y	Y[2]	Y	Y[2]	Y[2]	2 years	731
PRESENTATION TECHNOLOGIES	Screen Star	$3995	$495	2000	3.5	0/0[4]	Y	Y	Y	Y	Y	Y	1 year	732
	Montage FR1	$6995	$895	4000	3	8/8	Y	Y	Y	N	Y	N	1 year	732

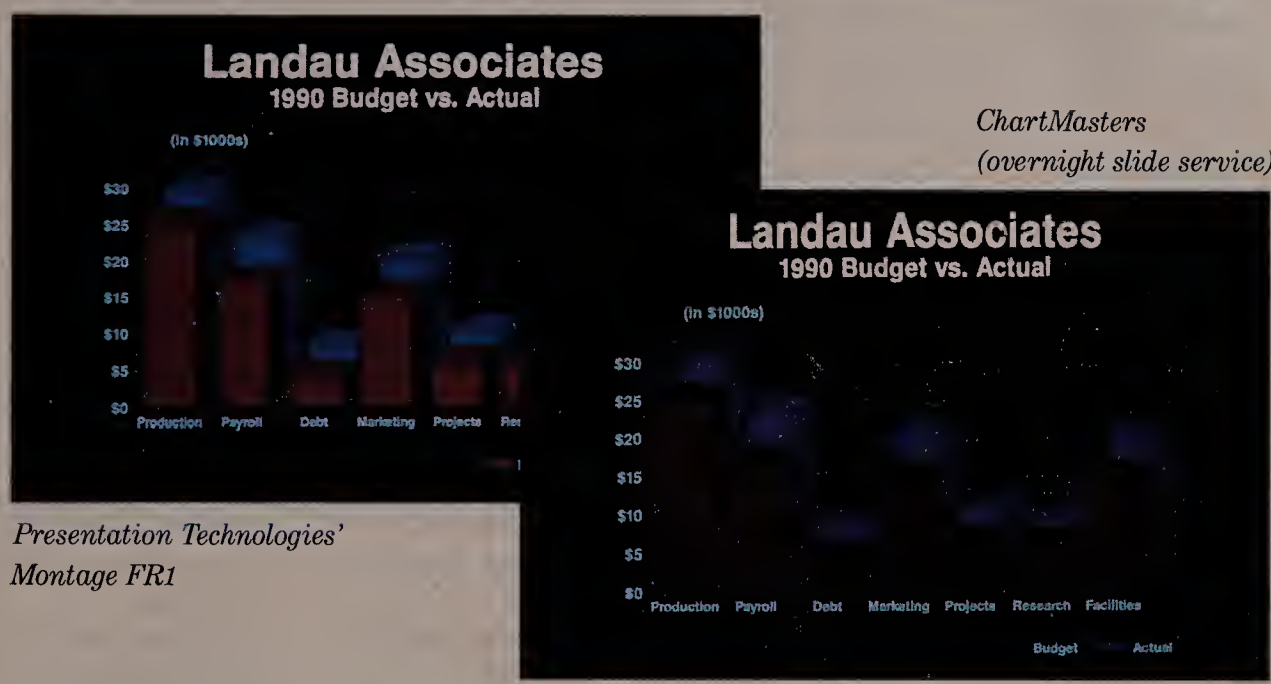
[1] Measured diagonally. [2] Requires separate utility. [3] 4096 x 2732 lines with additional RAM. [4] Uses screen fonts. [5] PostScript-compatible model expected by June 1991.

For more information about all products in this table, circle reader service no. 909.

ments produce smoother curves.

Plotters are generally slow, though speed varies according to pen type and image complexity. Plotter pens change directions so often they rarely hit full throttle, so diagonal acceleration (measured in *g's*, or units of gravity) has more bearing on performance than maximum velocity. Cost depends largely on the types and sizes of paper the machine can handle—an A-size (8½-by-11-inch) model starts at around $700; an E-size (36-by-48-inch) unit for creating large-scale diagrams costs $4000 or more. Make sure your graphics applications support the plotter you want to use. While all the plotters in the table support the HP-GL standard, specific device drivers let you do more with the machine.

OVERNIGHT OR OVER EASY—DO-IT-YOURSELF SLIDES



Presentation Technologies' Montage FR1

ChartMasters (overnight slide service)

Film recorders offer faster turnaround on 35mm slides, with quality comparable to a service bureau's.

COLOR ON THE SLIDE

A desktop slide recorder puts you in charge of slide production—a big plus when you need to make changes to a presentation and can't wait 24 hours for a service bureau to return your slides. Although they usually are big-ticket items, we've uncovered a handful of recorders that give you complete control over slide production for under $10,000.

But while a recorder can save you time, it won't necessarily save you money. If you buy a $4000 model, you'll have to make around 250 slides before you realize any savings over the $15 to $20 per slide charged by service bureaus, and the quality usually isn't as good.

The recorders listed here capture images using a small monochrome cathode ray tube (CRT) and color filters. Again, the main issue is slide quality, and eyeball judgments are more important than specs—a 4000-line slide from a $12,000 recorder usually looks much sharper than one produced on a $5000 unit, thanks to the pricier model's superior CRT and optics. Generally, bigger CRTs produce better-looking slides. Lower-cost recorders create fine slides for use with small audiences, but if you project images to widths of 15 feet or more, you'll want to shell out for a higher-quality machine.

All the devices in the table support full 24-bit color, and most come with drivers for popular graphics packages. Make sure that the device supports the typefaces you use—PostScript support is a big plus. Most recorders offer an instant camera attachment that gives you quick sneak previews of slides; look for models that offer one as standard equipment.

JOHN GREENLEIGH

Color scanners help bring real-life images to your PC. Whether you choose a desktop (left), hand-held (bottom), or 35mm-slide scanner depends on the kind and size of pictures you need to capture.

HERE'S LOOKING AT YOU—IN COLOR

One day you'll be creating color documents and presentations—maybe not today or tomorrow, but soon, and for the rest of your life. Before you take the plunge, you need to decide on the level of color quality you need. Then look for products that offer the best combination of quality, convenience, cost, and serviceability. It could be the start of a beautiful friendship.

Bob Weibel is a freelance writer in Ashland, Oregon. Daniel Tynan is an associate editor for PC World.

WHERE TO BUY

A4Tech (USA) Corp.
124 Raymond St.
Hasbrouk Heights, NJ 07604
201/288-3060 (fax)

Agfa Compugraphic
One Ramland Rd.
Orangeburg, NY 10962
914/365-0190,
914/359-3201 (fax)

Alps America
3553 N. First St.
San Jose, CA 95134
800/825-2577,
408/432-8337,
408/432-6035 (fax)

AVR, Inc.
2201 Qume Dr.
San Jose, CA 95131
800/544-6243,
408/434-0968 (fax)

Barneyscan Corp.
1125 Atlantic Ave.
Alameda, CA 94501-1145
415/521-3388,
415/521-9780 (fax)

CalComp
2411 W. LaPalma Ave.
Anaheim, CA 92803
800/225-2667,
714/821-2832 (fax)

Chinon America, Inc.
660 Maple Ave.
Torrance, CA 90503
800/441-0222,
213/533-1727 (fax)

Citizen America Corp.
P.O. Box 4003
Santa Monica, CA 90411-4003
213/453-0614,
213/453-2814 (fax)

C-Tech Electronics, Inc.
P.O. Box 19673
Irvine, CA 92713-9673
714/833-1165,
714/757-4533 (fax)

DFI Inc.
2544 Port St.
W. Sacramento, CA 95691
916/373-1234,
916/373-0221 (fax)

Digital Equipment Corp.
6 Technology Park Dr.
Westford Technology Park
Westford, MA 01886-1197
508/351-4401,
508/635-8556 (fax)

Eastman Kodak Co.
901 Elmgrove Rd.
Rochester, NY 14653
800/344-0006

Epson America, Inc.
20770 Madrona Ave.
Torrance, CA 90509-2842
800/289-3776

GCC Technologies
580 Winter St.
Waltham, MA 02154
800/422-7777,
617/890-0822 (fax)

General Parametrics Corp.
1250 Ninth St.
Berkeley, CA 94710
415/524-3950,
415/524-9954 (fax)

Genicom
One Genicom Dr.
Waynesboro, VA 22980-1999
800/443-6426,
703/949-1392 (fax)

Hewlett-Packard Co.
19310 Pruneridge Ave.
Cupertino, CA 95014
800/752-0900

Houston Instrument
8500 Cameron Rd.
Austin, TX 78753
800/444-3425,
512/835-1916 (fax)

Howtek Inc.
21 Park Ave.
Hudson, NH 03051
800/444-6983,
603/880-3843 (fax)

Ioline Corp.
12020 113th Ave. NE
Kirkland, WA 98034
206/821-2140,
206/823-8898 (fax)

Japan Digital Laboratory Co.
4770 Calle Quetzal
Camarillo, CA 93012
805/388-8709,
805/388-8708 (fax)

KYE Int'l
2605 E. Cedar St.
Ontario, CA 91761
800/456-7593

Lasergraphics, Inc.
20 Ada
Irvine, CA 92718
714/727-2651,
714/727-2653 (fax)

Marstek Inc.
17795 Skypark Cir., Ste. F
Irvine, CA 92714
800/366-4620,
714/833-7813 (fax)

Microtek Lab, Inc.
680 Knox St.
Torrance, CA 90502
800/654-4160,
213/321-2121,
213/538-1193 (fax)

Mitsubishi Electronics America, Inc.
991 Knox St.
Torrance, CA 90502
800/843-2515,
213/527-7661 (fax)

Mouse Systems Corp.
47505 Seabridge Dr.
Fremont, CA 94538
415/656-1117,
415/656-4409 (fax)

Mutoh America Inc.
895 Cambridge Dr.
Elk Grove Village, IL 60007
708/952-8880,
708/952-8808 (fax)

NCL America Computer Products
1753 S. Main St.
Milpitas, CA 95035
800/521-0121,
408/956-1006

NEC Technologies, Inc.
1414 Massachusetts Ave.
Boxborough, MA 01719
800/632-4636,
508/264-8673 (fax)

Nikon, Inc.
1300 Walt Whitman Rd.
Melville, NY 11747
516/547-4355,
516/547-0305 (fax)

Nisca Inc.
1919 Old Denton Rd. #104
Carrollton, TX 75006
214/242-9234,
214/245-0942 (fax)

NISE Inc.
20018 State Rd.
Cerritos, CA 90701
213/860-6708,
213/860-6928 (fax)

Océ Graphic USA, Inc.
385 Ravendale Dr.
Mountain View, CA 94039-7169
800/545-5445

Okidata
532 Fellowship Rd.
Mt. Laurel, NJ 08054
800/654-3282,
609/778-4184 (fax)

Our Business Machines
12901 Ramona Blvd., Ste. J
Irwindale, CA 91706
800/433-1435,
818/337-9614,
818/960-1766 (fax)

Panasonic Communications & Systems Co.
2 Panasonic Way
Secaucus, NJ 07094
800/742-8086,
201/348-7000

Polaroid Corp.
575 Technology Sq.
Cambridge, MA 02139
800/225-1618,
617/577-5718 (fax)

Presentation Technologies
779 Palomar Ave.
Sunnyvale, CA 94086
800/782-2543,
408/749-0746 (fax)

QMS, Inc.
One Magnum Pass
Mobile, AL 36618
800/523-2696,
205/633-4300,
205/633-4866 (fax)

Roland Digital Group
1961 McGaw Ave.
Irvine, CA 92714
714/975-0560,
714/975-0569 (fax)

Seiko Instruments USA, Inc.
1130 Ringwood Ct.
San Jose, CA 95131
408/922-5800,
408/922-5835 (fax)

Sharp Electronics
Sharp Plaza
Mahwah, NJ 07430
800/237-4277,
201/529-9454

Star Micronics America, Inc.
420 Lexington Ave. #2702
New York, NY 10170
800/447-4700,
212/286-9063 (fax)

Tektronix, Inc.
26600 S.W. Pkwy.
Wilsonville, OR 97070-1000
800/835-6100,
503/682-3408 (fax)

UMAX Technologies, Inc.
2352 Walsh Ave.
Santa Clara, CA 95051
800/562-0311,
408/982-0771,
408/982-0776 (fax)

United Innovations
171 Interstate Dr.
West Springfield, MA 01089
413/733-3333,
413/785-1993 (fax)

Xerox Engineering Systems
Versatec Products
2710 Walsh Ave.
Santa Clara, CA 95052
408/988-2800,
408/727-2399 (fax)

XRS
4030 Spencer St. #101
Torrance, CA 90503
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This morning, this entire presentation was just a scribble.

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Circle 221 on reader service

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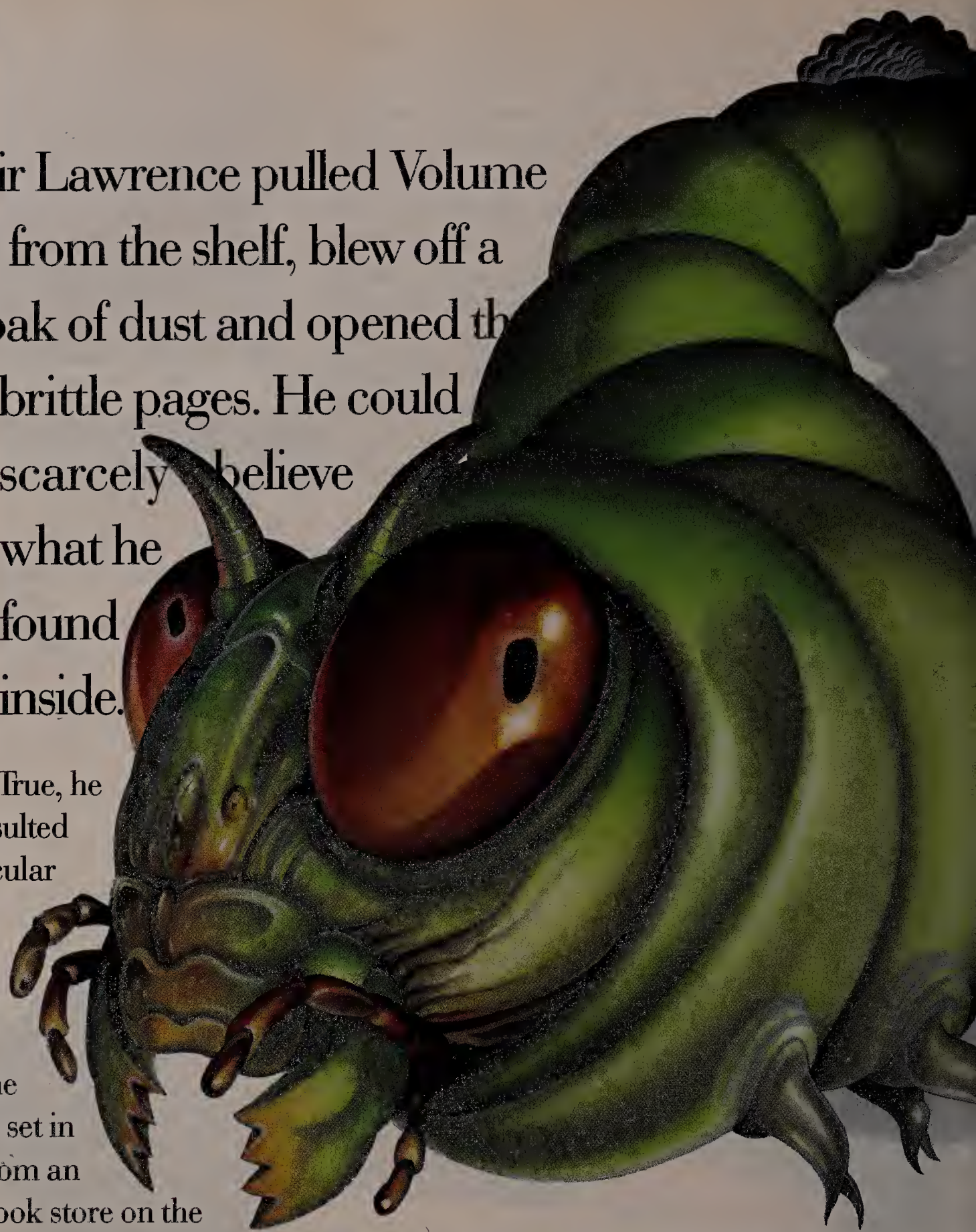
Sir Lawrence pulled Volume IV from the shelf, blew off a cloak of dust and opened the brittle pages. He could scarcely believe what he found inside.



True, he hadn't consulted these particular journals in years and, admittedly, he had acquired the ten-volume set in his youth from an odd little book store on the Thames, but still! Holes!? A bookworm had eaten clean through the pages. Indeed, to Sir Lawrence's considerable chagrin, he found the ravenous little bugger had chewed, in a straight line, from the front cover of Volume I to the back cover of Volume X.

All of which brings us to our seemingly simple question: If each book is exactly two inches thick, how far did the bookworm travel?

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In tussling with this type of cerebral aerobics most people make a simple but serious error: They *assume* something. Of course, this happens without realizing it. But still, it happens.

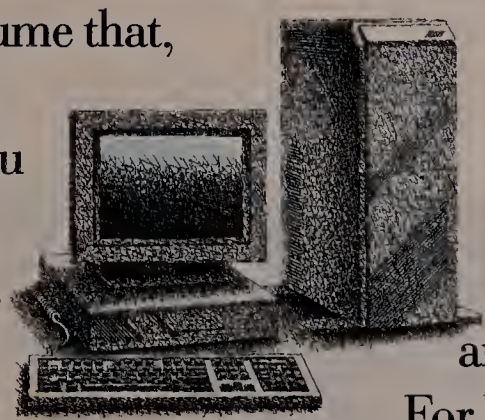
As you'll see in a moment, the way to avoid making a false assumption is to work things out methodically. Carefully thinking through each step.

For instance, consider this question. A company makes one of the broadest lines of computer terminals in the world. They have for years. In fact, they've delivered over three million of them.

If you needed terminals you'd probably think of them. But what if you needed PCs? Would you assume that, since this company is so dominant in terminals, they must not do a real number in PCs?

Tsk, tsk. Have you learned nothing?

Well, as you may have *correctly* assumed, the company in question is Wyse. And if you've been assuming we don't have an impressive array of powerful, priced-right PCs it would be a shame. For both of us.



The Decision Series PCs: 386sx/16s (shown), 386sx/20, 486/25, 486/33e (shown). Advanced ergonomics, finicky attention to detail, exceptional power for the dollar.

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Of course we realize there's a good chance some of you may have read this far because you're more interested in the answer to our puzzle than in our products. You've *assumed* we'd bury the answer down here somewhere. Well, you're wrong again. At least partially. So go look on page 269.

Now that it's clear we make an impressive line of PCs, you might be tempted to assume we stop there and don't get into the even more sophisticated products like super fast multiprocessing systems for the UNIX environment. With speed in the 100 MIPS range.

But you wouldn't assume that after all this. Would you?

To learn more about our Decision Series PCs call us. We'll send you complete specs plus a poster of additional Cerebral Aerobics. To help keep your original equipment personal computer in top form. 1-800-GET WYSE.

WYSE

You're doing it again. Just because this little type is down here and printed upside down you assumed you'd find the answer this easily. No way. San Jose. Refer back up to the ad and your patience will be rewarded.

Circle 322 on reader service card

Face-Off: PageMaker

Put two publishing pros in a locked room with a couple of PCs, give them a select mix of layout and formatting tasks, and you'll learn a lot about the two top desktop publishing packages.

Aldus technical writer Olav Martin Kvern puts PageMaker to the test.

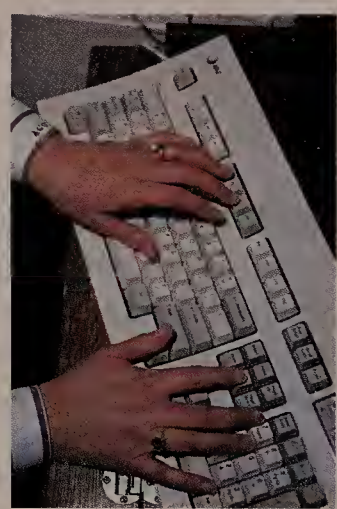
The day may arrive—or maybe it already has—when creating crucial documents for many pairs of eyes becomes a regular part of your job. For serious desktop publishing like this, you've got two obvious options: *PageMaker 4.0* and *Ventura Publisher 3.0*. These rivals have long dominated page layout for the PC, and because both now cost the same ($795) and run under *Windows*, competition is fiercer than ever.

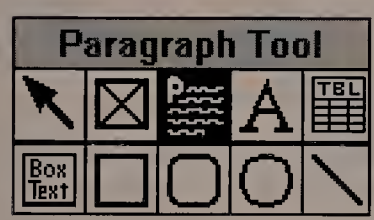
The choice between these desktop publishing titans used to be clear-cut: *Ventura* for long, structured documents such as books and technical manuals, and *PageMaker* for short, design-oriented publications such as brochures and newsletters. But this hard-and-fast distinction is blurring, thanks mainly to *PageMaker 4.0*'s new and improved long-document capabilities.

To help you decide which package is best for you, *PC World* flew in a *PageMaker* expert and a *Ventura* expert to join us at our San Francisco editorial office.

vs. Ventura

Christine Whyte and Richard Jantz

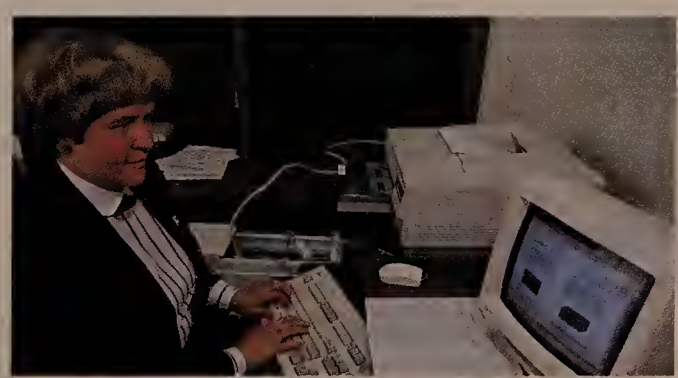




Under our watchful eyes, these publishing pros used their respective programs to produce the same set of predesigned test documents: a 1-page brochure, a 4-page newsletter, and a 25-page technical manual.

Besides typifying three of the kinds of documents you're most likely to produce, our tests aimed to show some of the programs' striking similarities and differences. Most important, the tests reveal how often each program requires you to follow a manual step-by-step procedure rather than automatically doing the job for you.

In the following pages, we describe the techniques that Olav Martin Kvern, technical writer for Aldus, and Anne Galdos, product marketing manager for Ventura Software, used to complete six of the publishing tasks required to create our test documents. Compare these with documents of your own, and you'll gain insight into which desktop publishing program best fits your needs.

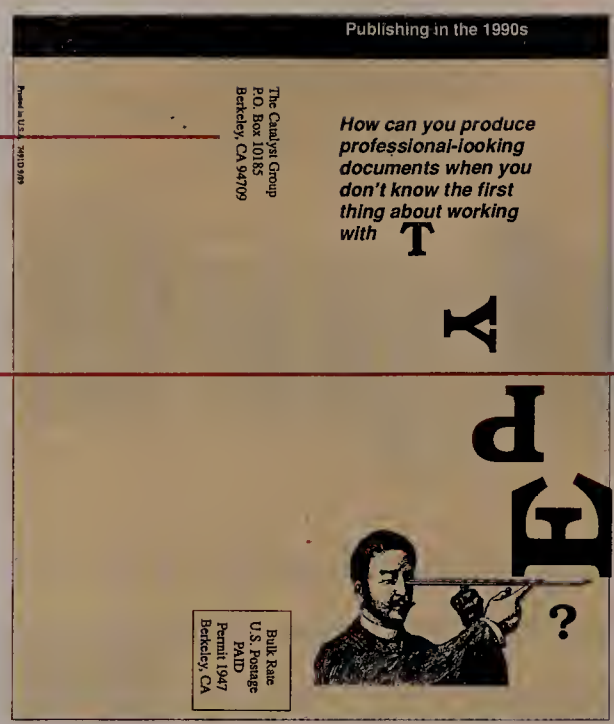


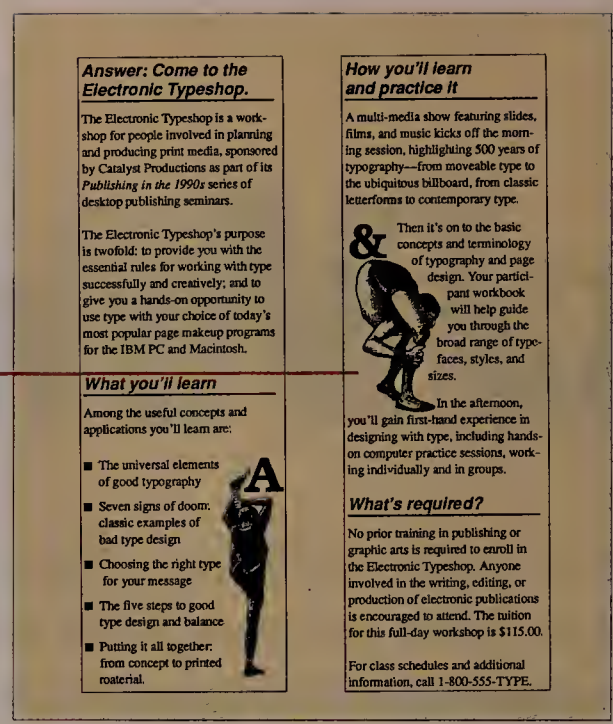
FRED MERTZ

Anne Galdos, Ventura's product marketing manager, kerns under pressure.

Task 1: Create Rotated Text

Task 2: Wrap Text Around a Graphic





We used this sample brochure to test each program's ability to handle unique designs, including rotated text and text that fits irregularly around a graphic—both attention-getting effects favored by graphic artists. PageMaker is easier to use than Ventura at such jobs.

Task 1: Create Rotated Text

When preparing copy for mailings (return addresses and so on), you'll often want *rotated text*—type printed sideways or upside down. Rotated text is also useful as a design element and for vertical table headings in forms and schedules.

PageMaker's text rotation feature (shown here) is easier to learn and use than Ventura's, which uses the numbers 90, 180, 270, and 0 instead of simple icons.

Plug in the right commands, and both *Ventura* and *PageMaker* will automatically rotate text in 90-degree increments. The key difference is that *Ventura* uses a pulldown menu to list the text rotation options for 90, 180, 270, and 0 degrees, while *PageMaker* uses simple icons for the same choices, making the program easier to learn and use.

Anne and Olav used similar techniques to prepare the text before rotating it. In *Ventura*, Anne drew a separate box to hold each block of text to be rotated, then created a *style tag* (paragraph formatting instruction) for each different degree of rotation. In *PageMaker*, Olav created a separate block of text with its own style tag for any rotated type.

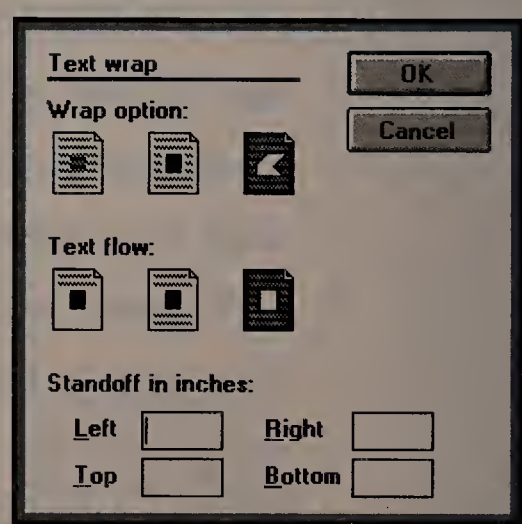
As for editing rotated text, each program offers its own advantage. In *PageMaker*, Olav triple-clicked the rotated text to open the program's built-in Story Editor and display the text in its normal (horizontal) position, which is preferable for extensive editing. In *Ventura*, Anne edited the text directly on the page, where it remained rotated, preferable for minor changes.

Task 2: Wrap Text Around a Graphic

Wrapping text around graphics is a popular, attention-getting design technique. If you do this manually, you may spend a lot of time tweaking the text so that it conforms to the shape of the graphic and adjusting the *standoff*, the amount of white space between the graphic and the text. In this instance, *PageMaker* is the answer to your prayers—its automated text-wrap feature is efficient and easy to use. *Ventura* requires manual labor, which means you may spend about twice as much time to get the results you want.

Using *PageMaker*, Olav started by choosing an option that automatically wrapped the text around the contortionist graphic. Then, clicking at different points on the dotted line that marks the on-screen wrap boundary between the text and the graphic, he stretched the boundary into the shape he wanted. He also used the default standoff of 1 pica.

Ventura wraps text automatically only around rectangular objects. To repel the text from the irregularly shaped graphic, Anne had to add a new frame under the graphic for each line of abutting text. By widening or narrowing each of these extra frames, she determined the amount of white space needed between the graphic and the text, thus creating the same text-wrap shape as in the sample brochure.



PageMaker's text-wrap feature (shown here) is better than Ventura's, which can't wrap text automatically around an irregularly shaped object.

Task 3: Find and Replace Text

Task 4: Add a Graphic With a Caption

GP BUSINESS FILE

The GP Corporation • "American Business Trends" • Vol. 3, No. 1

With high-rise investments on the upswing, a new downtown America is emerging.

The Rebirth of the Downtown Office Market

San Jose's downtown area is now in the midst of a rebirth, following decades of decline and stagnation. The once troubled commercial center has recently been restored by the construction of new retail and mixed-use complexes, a luxury hotel, a convention center, and high-rise office towers. The transformation has been fostered by extensive public and private investment. The public sector, through redevelopment powers, has expanded downtown infrastructure, with special emphasis on parking, transportation and public parks, and has contributed land to private development. Private firms have responded by creating a multistory skyline of office buildings in the city's downtown.

Underlying this investment in downtown San Jose is the belief that the booming high-tech economy of Silicon Valley needs a centralized service area to meet financial, legal and other needs, and that downtown San Jose is the appropriate site for this center. More generally, San Jose's new downtown is part of a larger trend nationwide to restore declining downtowns and to rebuild centralized business cores.

Yet this movement has occurred in a period when suburban office growth has also been strong. Is a new role emerging for downtowns as they compete with nearby suburban areas, and does this role support the amount of new highrise investment that is occurring in downtown areas? This question is particularly relevant to downtown San Jose, which competed poorly against expanding suburban retail centers in the 1950s and 1960s.

Research by the GP Corporation, in cooperation with the City of San Jose Office of Economic Development, examined the demand for

(Continued on page 3)

San Francisco's office market continues to expand in 1991.

INSIDE...

- GP's Next Symposium is coming soon. Page 2
- Mail-Order Magic has produced a $100-billion-a-year industry. Page 4.

1

With this sample newsletter, Anne and Olav evaluated the talents of PageMaker and Ventura at multicolumn text and graphics. Tasks included resizing a photograph, adding a caption, and making global changes to the text.

With PageMaker's Story Editor, you can find and change selected text in a document without using a separate word processor.

Task 3: Find and Replace Text

To produce newsletters and other deadline-driven documents, you need a program that helps you make last-minute copy changes in a hurry. Unless you can accomplish the editing inside your publishing program, you must go to your word processor, make the changes, and then reopen the publication file—a time-consuming process.

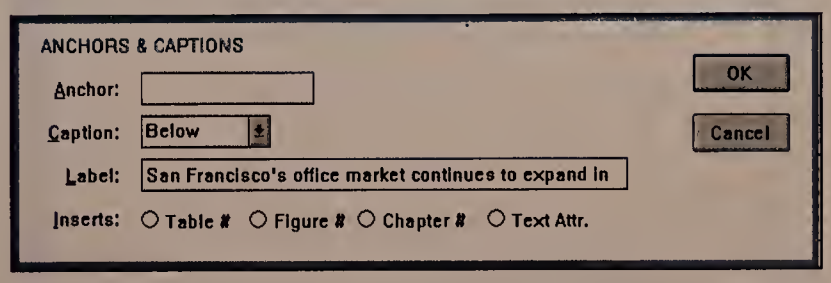
In this task, which involved changing every % sign in a newsletter article to the word *percent*, we learned that *Ventura*'s text editing capabilities pale in comparison to those of *PageMaker*'s Story Editor, the program's powerful new text editor. Anne chose to exit *Ventura*, used *WordPerfect* to make the global text changes, then reopened the edited file in her *Ventura* document. But Olav used the Story Editor's search-and-replace-text feature and changed the pesky % sign in a fraction of the time. This and other word processing features make *PageMaker* the better choice for documents that require global text editing—especially at the last minute.

Task 4: Add a Graphic With a Caption

Today, most newsletters present information graphically—in photos, illustrations, tables, or charts. A good desktop publishing program lets you easily size a graphic, *crop* (trim) its edges to show only the portion you want, and link a caption to the graphic so the two stay "glued" together in the layout.

With both *PageMaker* and *Ventura*, it's easy to size and crop a graphic. In *Ventura*, Anne drew a frame approximately the size necessary for the graphic, and when she inserted the photo, it conformed to the frame's dimensions. To crop the photo, she simply moved it around in the frame until the desired portion was showing. In *PageMaker*, Olav placed the graphic first, then sized it by snapping the photo's edges to vertical and horizontal *ruler guides* (nonprinting guidelines) that he had arranged to form the properly sized rectangle. He used the same cropping method as Anne.

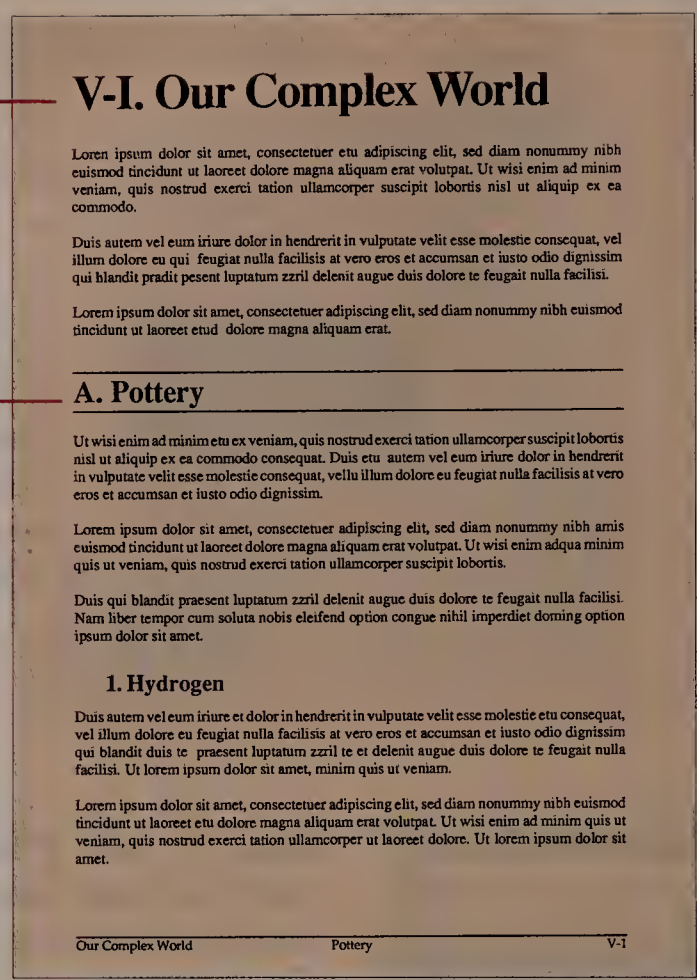
Anne went one step further, however. She fine-tuned her layout by entering the graphic's exact height and width into a dialog box. Besides providing that extra precision, *Ventura* automatically links a caption to the graphic. Using a *Ventura* dialog box, Anne placed the automatic caption below the graphic (she could have placed it above the caption or on either side) and entered the caption words on a blank line. In *PageMaker*, Olav created the caption as a separate text box and had to link it to the graphic manually.



Unlike PageMaker, Ventura provides an option (shown here) that lets you attach caption text to any graphic in a document. Move the graphic, and the caption moves with it.

Task 5: Add Numbers to Headings

Task 6: Create a Table of Contents From Headings



V-I. Our Complex World

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A. Pottery

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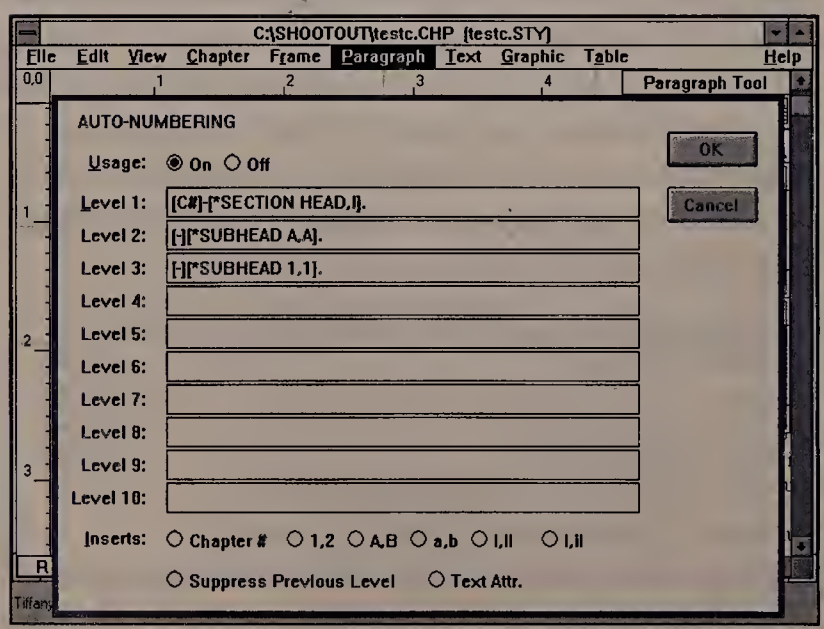
Our Complex World Pottery V-1

This sample technical manual tests each program's skill at long-document handling, including the ability to add section numbers to headings, update them after changes are made, and generate a table of contents. PageMaker's new long-document features are a vast improvement over earlier versions, but Ventura still handles this type of document better.

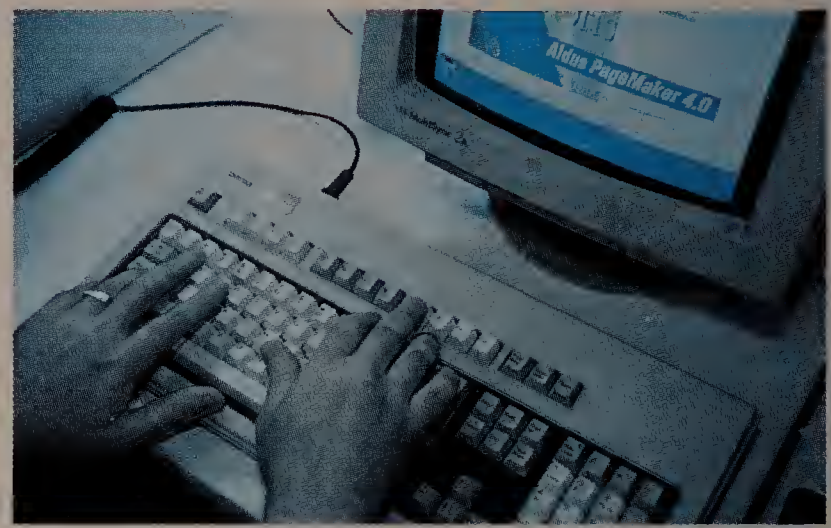
Task 5: Add Numbers to Headings

Whether you produce a 20-page or a 200-page manual, you'll usually have to number chapters, section headings, subheads, and figures. A desktop publishing program that automatically numbers these items is an invaluable time-saver, especially if you make changes and end up having to renumber everything.

In this task, *Ventura* shines. When you first create a document, you choose a numbering scheme, such as the standard outline format of Roman numerals, letters, and numbers for different heading levels. From then on, *Ventura* does all the numbering for you automatically. In *PageMaker*, you have



Ventura automatically numbers every heading level in your document according to the format you choose.

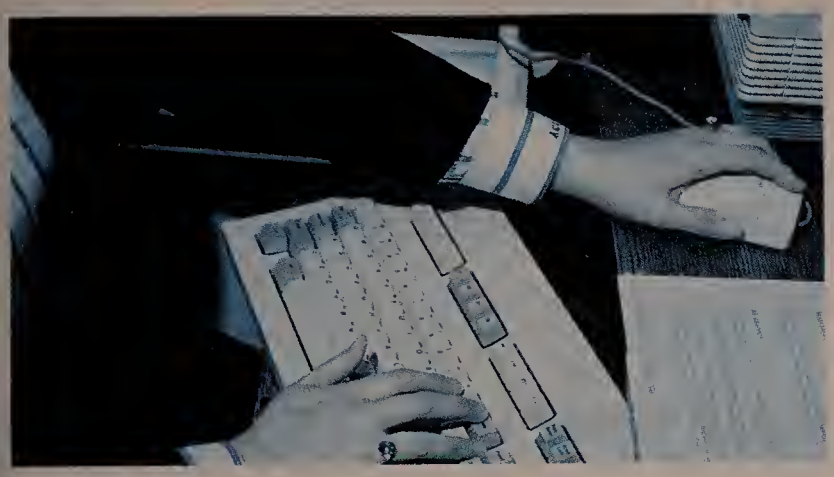


to search for each heading and enter the correct number manually.

Anne followed two steps in *Ventura* to number the manual's headings. The first was to assign a numbering scheme to the three heading levels. The second step was to align the section number ("V-I." on our sample page) next to the section heading ("Our Complex World")—necessary because *Ventura* automatically placed the number *above* the heading instead. Anne used several dialog boxes to align these two elements.

Olav used *PageMaker*'s Story Editor to search for each heading level and then entered the correct number in front of each heading. He suggested that alternatively you could export the text file to *Word for Windows* because that program numbers headings in the correct order. It's plain that for this task, *PageMaker* takes longer than *Ventura*, especially with particularly lengthy or complex documents.

FRED MERTZ

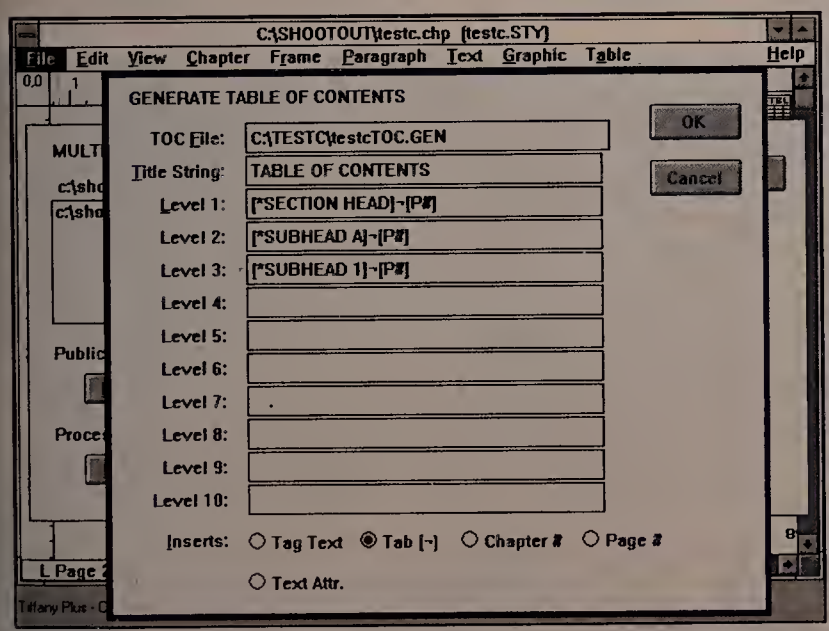


Task 6: Create a Table of Contents

One element that long documents and many business reports share is a table of contents (TOC), which both *PageMaker* and *Ventura* can automatically generate and format. To produce one with the proper page numbers, you must assign style tags to titles and subheads; the program then grabs these items and generates a TOC file that you can place on the page and format.

In selecting the tags to include in the TOC, Anne finished faster than Olav because *Ventura* lets you enter all the tag names on one form, while *PageMaker* has you use a dialog box for *each* TOC level. The remaining steps are the same in both programs: You pick a menu option to generate the TOC, and then you format the resulting text file.

Ventura's TOCs won't go any deeper than ten levels, while *PageMaker*'s TOCs can conceivably include text tied to every tag in a document. But unless your TOC requires extraordinary detail, *Ventura*'s single-form approach is faster and more flexible, especially for generating a separate list of all figures and tables. *PageMaker* can create a three-level index (compared with *Ventura*'s two levels), but only *Ventura* has automatic footnoting and cross-referencing within text—vital time-savers for lengthy documents.



With Ventura, you use a single form to list the tag names you want in a table of contents, including chapter numbers, text attributes (such as bold), and other formatting instructions.

THE PROOF'S IN THE PUBLISHING

As Anne and Olav have helped demonstrate, the old cliché about using *PageMaker* for design-intensive documents and *Ventura* for long documents still applies, but not categorically. *PageMaker*'s newfound capabilities—a high 999-page ceiling on document size, plus the ability to generate a table of contents, an index, and page numbers automatically—make it far more practical than it once was for big projects.

But with more automated features than *PageMaker*, *Ventura* still has the edge for manuals, technical papers, quarterly reports, and the like. Only *Ventura* automatically numbers chapters, headings, and figure captions and then renumbers them if you move or delete a section or make other revisions. It also provides such labor-saving features as automatic footnoting, complex cross-referencing, and a built-in equation editor.

Now that you've had a close look at how these programs handle key tasks, we hope you've gained better insight into which one is right for you. For many jobs, either package will do handily, but if you want one program that lets you create the broadest possible range of business documents, choose *Ventura*. *PageMaker* is still the better choice for graphic artists, but *Ventura* is better for everyone else.

Christine Whyte, formerly an editor for Publish, *is now a freelance editor in San Francisco. Richard Jantz is a contributing editor for* PC World.

Task Scorecard

	PageMaker 4.0	Ventura Publisher 3.0
1. Rotate text	✓	
2. Wrap text around graphic	✓	
3. Find and replace	✓	
4. Add a graphic with caption		✓
5. Add numbers to headings		✓
6. Create table of contents		✓

WHERE TO BUY

PageMaker 4.0 $795; Aldus Information Center, 3441 MacArthur Blvd., Santa Ana, CA 92704; 800/333-2538, 206/628-2320 REQUIREMENTS: 2MB RAM, hard disk, Windows 3.0, graphics display, mouse; TECHNICAL SUPPORT: unlimited, toll number, M–F 7–5; OTHER SUPPORT: bimonthly magazine, CompuServe forum. **Reader service no. 703.**

Ventura Publisher 3.0, Windows Edition $795; Ventura Software, Inc., 15175 Innovation Dr., San Diego, CA 92128; 800/822-8221, 619/673-7586 (fax). REQUIREMENTS: 2MB RAM, hard disk, Windows 3.0, graphics display, mouse; TECHNICAL SUPPORT: unlimited, toll number, M–F 9–5; OTHER SUPPORT: monthly magazine, CompuServe. **Reader service no. 704.**

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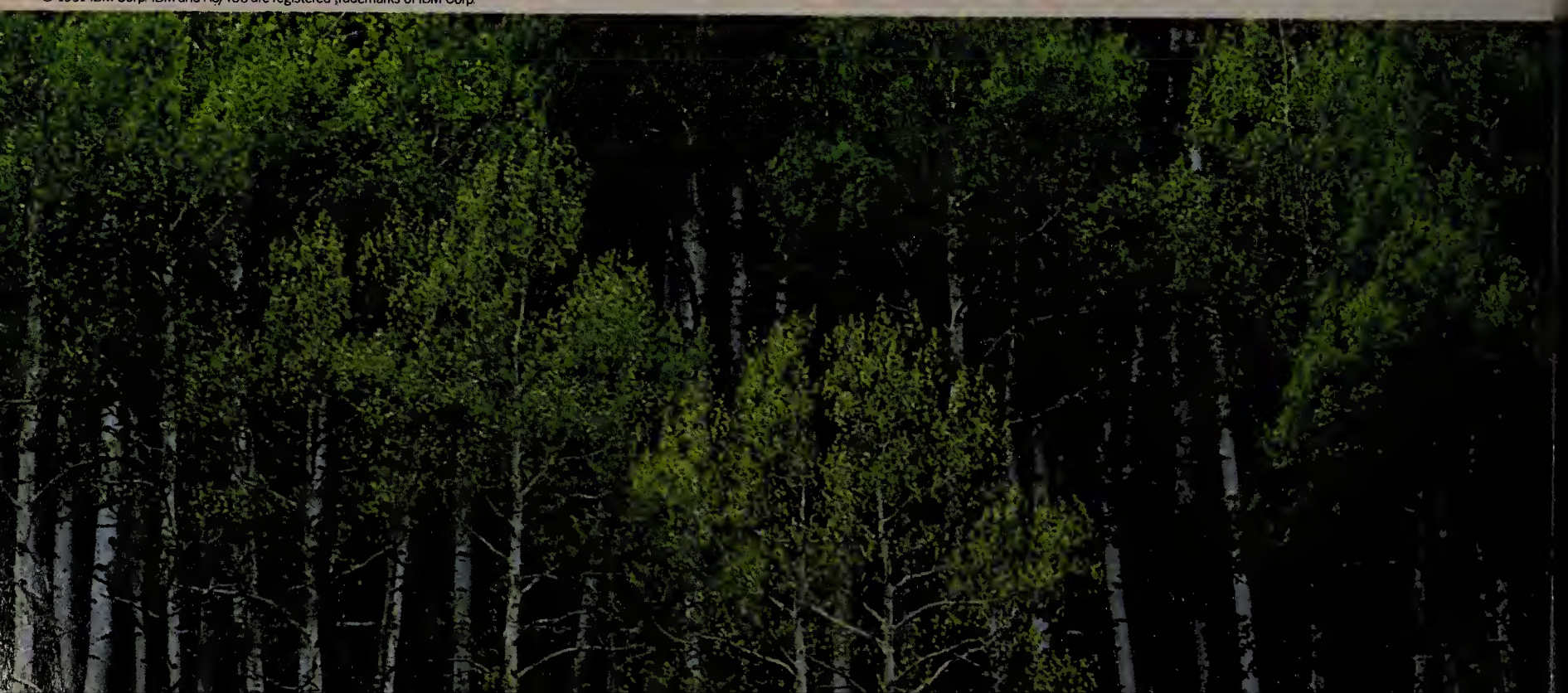

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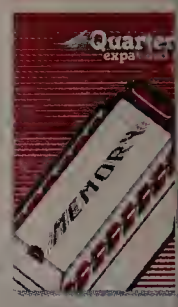
QEMM Breaks the 640K Barrier

Break the 640K barrier in DOS—or in Windows 3.0—and give your DOS programs up to 130K more room within the first megabyte of memory, plus another 96K of video memory, in some instances.

QEMM takes buffers, network drivers, TSRs and other memory-using utilities and moves them into idle areas between 640K and one megabyte.

It's not complicated. It's easy. Just type *Optimize* and QEMM does the rest.

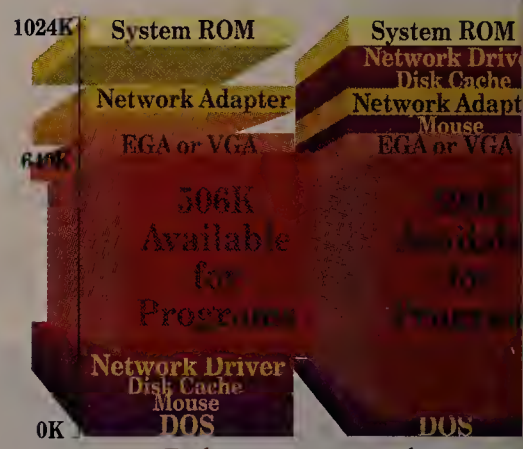
QEMM 386 is included with DESQview 386 to create the optimum operating environment for productivity oriented users of 386, 386SX and i486 PCs.



Number o

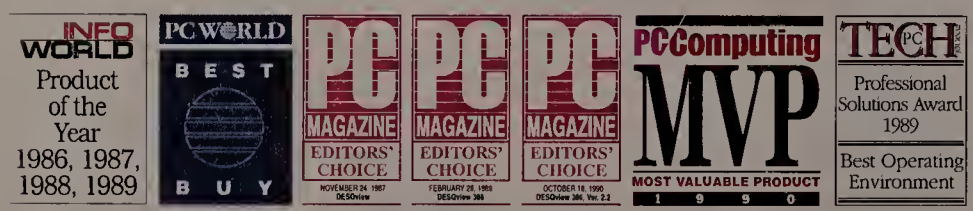
QEMM 50/60 is designed to work in IBM® PS/2™ Model 50 a 60 PCs with specific IBM adapte boards.

QEMM is the #1 selling utility according to distribution sources. In fact, it was the number one selling



Before *After*

software package in the PC industry April, May and June 1990.



These are some of DESQview's most recent awards

These are some of QEMM's most recent awar

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What Makes QEMM the Number One Selling Windows 3 Add-on?

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—David Alison, PC WEEK

#1

"When I ran OPTIMIZE...it attempted 9 million combinations before reporting the best configuration. My net gain was 140K of [increased] memory. Wow."

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Pasadena IBM Users Group

"QEMM 5.1 is everything you might want in an advanced state-of-the-art memory manager—and more...it [is] unique in the market."

—Steve Gibson, InfoWorld

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❑ Please send information on QEMM 5.1

❑ Please send information on your new DESQview 2.3 that works with Windows 3.0

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It can point you to as much as 130K additional RAM your programs can e. It shows you which memory areas e faster. It even helps you compare ld-in memory board performance.

Manifest does for memory what PC Tools Deluxe does for disks. And it's easy to use.

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INFO WORLD BEST IN ITS CLASS Dec. 18, 1989

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MONITORS

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DESKTOP PUBLISHING

Cornerstone's portrait monitor and Radius's dual-page monitor both help increase productivity.

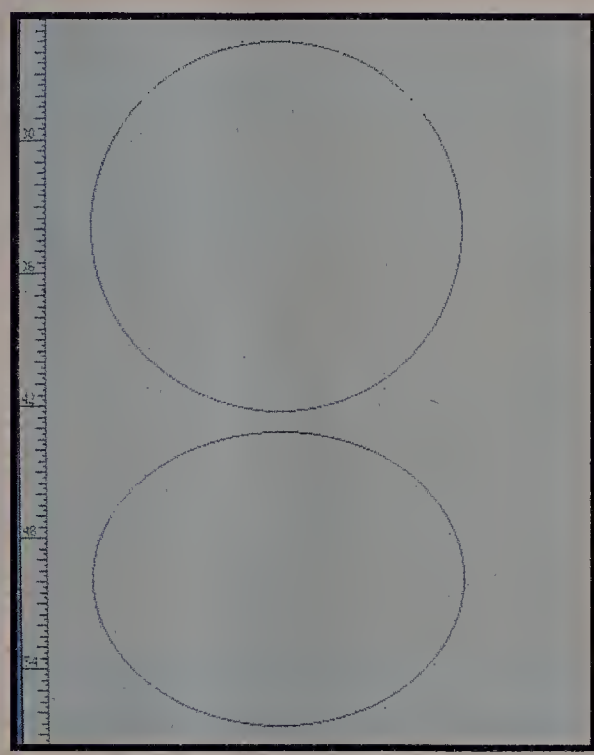
NOTHING MAKES A DESKTOP PUBLISHER MORE PRODUCTIVE THAN A JUMBO MONITOR THAT DISPLAYS TRUE-TO-LIFE PAGES. HERE'S HOW TO SELECT THE ONE THAT'S RIGHT FOR YOU.

If you spend at least half your time desktop publishing, an oversized high-resolution monitor can boost your productivity more than any single piece of hardware. With a clearer view of more of the page, you can vastly reduce the need to perform repetitive, time-consuming tasks like zooming, scrolling, and proof printing. A quality monitor also lessens eyestrain and eye fatigue.

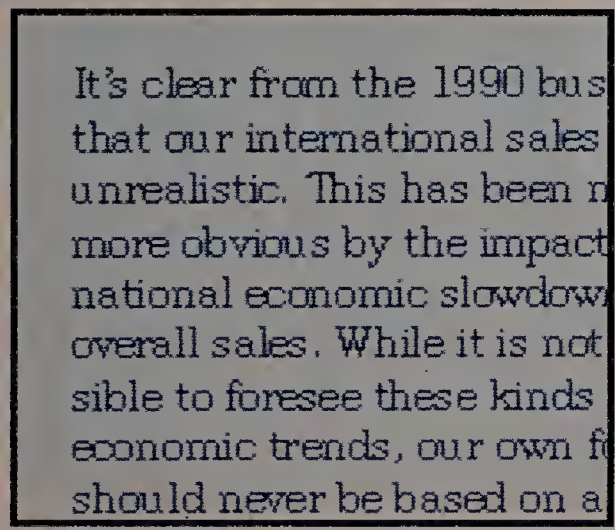
Because few desktop publishers can afford color publishing, this Buyers' Guide focuses on large monochrome monitors. When a big, sharp view of the page is paramount, why spend more on your display just to make windows look more colorful? Monochrome models may cost half as much as color units with the same resolution and generally deliver better speed.

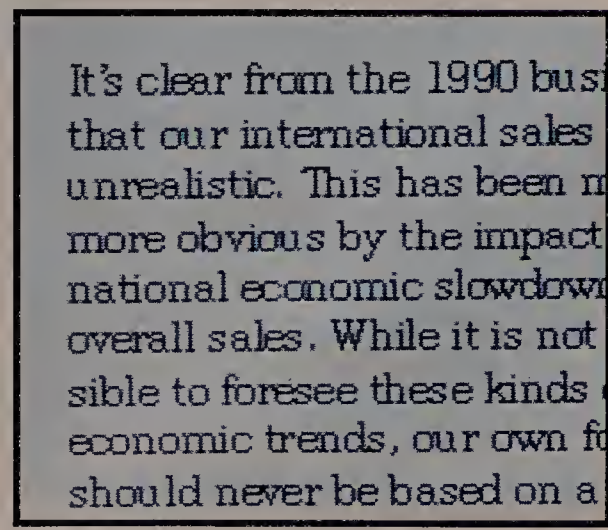
We've divided the monitors in this guide into two types: 15-inch portrait oriented monitors, designed to let you view a single 8½-by-11-inch page; and 18-to-24-inch dual page units. Portrait monitors best suit desktop publishers who create heavily formatted reports or single-page newsletters, marketing brochures, and the like. These monitors go for relatively little, from less than $900 to $1400.

If you design publications for outside rather than in-house distribution, go ahead and pony up the dollars for a dual-page monitor. Anyone who works with facing pages will benefit from being able to see a two-page spread just as readers will see it. The extra screen area means that toolboxes, rulers, and scroll bars won't overlap the image and that there's ample "pasteboard" room for *PageMaker* and *XPress*. You should expect

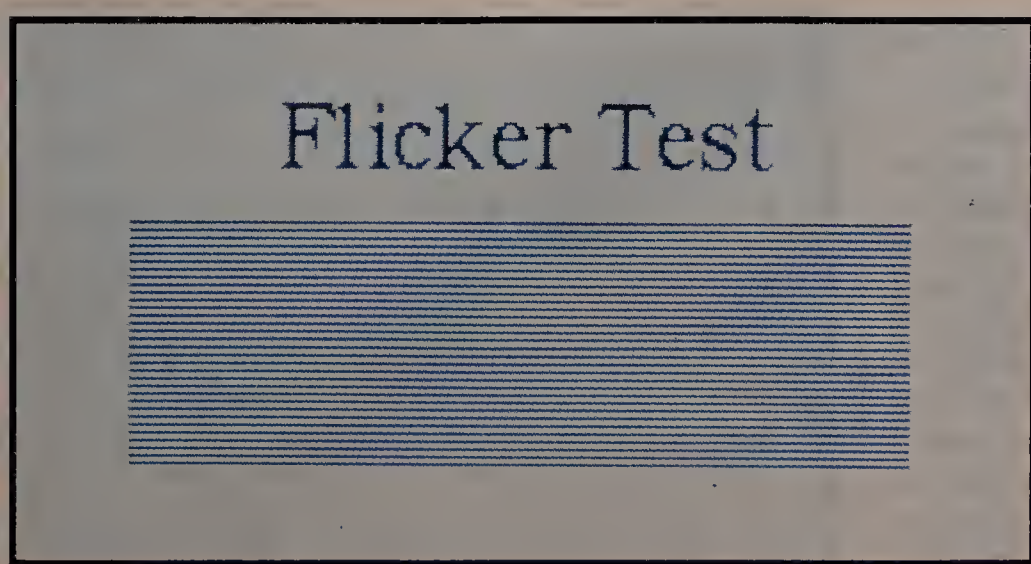


If a monitor doesn't use square pixels, the bit-mapped images can become distorted when rotated, like this circle.





Type should appear crisp and clear, without any fuzziness or halos around the letters. Look for a monitor that's easy on your eyes (left); staring at fuzzy text (right) will tire your eyes.



To test for screen flicker, set a series of 1-point rules separated by 1-point white spaces, and check for vibrating lines.

DUAL-PAGE MONITORS

Manufacturer	Product	Price[1]	Actual image (inches)[2]	Graphics coprocessor	RESOLUTION Maximum resolution[5]	RESOLUTION Pixels per inch
CORNERSTONE TECHNOLOGY	DualPage 150	$3395	19 x 13.8 x 10.2	N	2048 x 1664	150
	DualPage 120	$2495	19 x 13.8 x 10.2	N	1600 x 1280	120
ELITE BUSINESS APPLICATIONS	Design View/19E	$1695	19 x 14.5 x 11.75	Y	1280 x 1024	96
IBM	IBM PS/2 Display 8507	$1329	19 x 14 x 10.5	Y	1024 x 768[3]	73
	IBM PS/2 Display 8508	$1775	19 x 14 x 10.5	Y	1600 x 1200[4]	114
IMAGE SYSTEMS CORP.	M24LMAX	$1995[9]	24 x 17.5 x 12.75	Y	2048 x 1536	150
MIRROR TECHNOLOGIES	PixelView PC/II	$997	19.6 x 14.07 x 10.55	Y	2048 x 1024	91
	PixelView PC/IIH	$1297	19.6 x 14.07 x 10.55	Y	2048 x 1024	91
	PixelView PC/IIGS	$1797	19.6 x 14.07 x 10.55	Y	2048 x 1024	91
MONITERM CORP.	Viking 3/91 M	$1490	19.6 x 14 x 10.5	Y	1280 x 960	91
	Viking 3/91 GS	$2490	19.6 x 14 x 10.5	Y	1280 x 1024	91
	Viking 2400 M	$2490	24 x 17.5 x 13.2	Y	1280 x 960	72
	Viking 2/91 M	$1990	19.6 x 14 x 10.5	Y	1280 x 960	91
	Viking 2/115 M	$2290	19.6 x 14 x 10.5	Y	1600 x 1200	115
NISSEI SANGYO AMERICA	SuperScript	$2495	20 x 19.2 x 18.3	Y	1600 x 1280	110
PANASONIC COMMUNICATIONS & SYSTEMS	PanaPro M1900AT	$2099	19 x 13.9 x 10.4	Y	1280 x 960	92
PLANAR SYSTEMS, INC.	WS-XT/AT Workstation Monitor	$3995	17.8 x 13.6 x 11.5	N	1024 x 768	75
RADIUS, INC.	TPD/19-MCA	$2190	19 x 14.1 x 10.8	N	1280 x 960	90
	TPD/19-ISA	$2190	19 x 14.1 x 10.8	N	1280 x 960	90
	TPD/21-ISA	$2590	21 x 15.5 x 11.9	N	1280 x 960	82
	TPD/21-MCA	$2590	21 x 15.5 x 11.9	N	1280 x 960	82
SAMPO AMERICA	OfficePro II Graphics System	$1475	20 x 13.7 x 10.6	N	1280 x 960	92
	OfficePro IIo Graphics System	$3395	20 x 13.7 x 10.6	Y	1280 x 1024	92
SAMSUNG INFORMATION SYSTEMS AMERICA, INC.	PageMaster 2	$1498	8.15 x 14.17 x 11.3	Y	1280 x 1024	90
SIGMA DESIGNS, INC.	L-View GSP	$2695	19 x 14.1 x 10.2	Y	1664 x 1200	118
	L-View for PC	$2495	19 x 14.1 x 10.2	N	1664 x 1200	118
	L-View for PC (monochrome)	$2195	19 x 14.1 x 10.2	N	1664 x 1200	118
	L-View for PS/2	$2495	19 x 14.1 x 10.2	N	1664 x 1200	118
	SilverView (monochrome)	$2199	21 x 16 x 12	N	1152 x 870	72
	SilverView PS/2	$2199	21 x 16 x 12	N	1152 x 870	72
	SilverView GS	$2995	21 x 16 x 12	Y	1152 x 870	72
TAXAN AMERICA, INC.	CrystalView 1901	$2195	19 x 13.7 x 10	Y	1280 x 960	96
VENTEK CORP.	AT 2000	$2695	17 x 13.6 x 10.2	N	1280 x 960	94
	PS 2000	$2495	17 x 13.6 x 10.2	N	1280 x 960	94
VERMONT MICROSYSTEMS, INC.	PageManager 12	$1795	20 x 18 x 18	Y	1280 x 960	92
	PageManager/2-12-MCA	$1795	20 x 18 x 18	Y	1280 x 960	92
WYSE TECHNOLOGY	WY-790N	$1848[11]	19 x 13.8 x 11	N	1280 x 1024	83

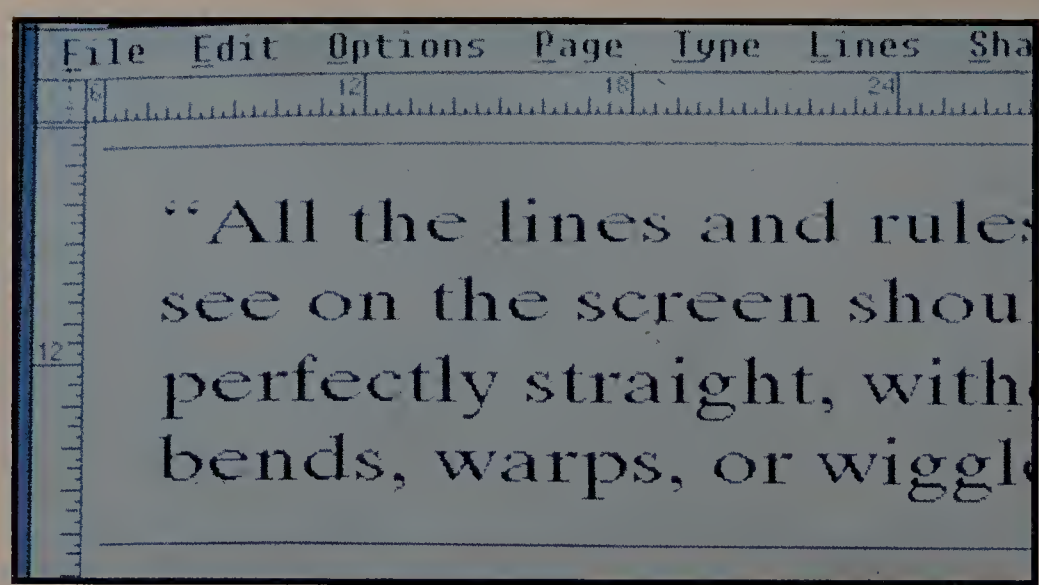
[1]Price includes controller board.
[2]Depth by width by height.
[3]Highest resolution in noninterlaced mode is 640 x 480.
[4]Highest resolution in noninterlaced mode is 1360 x 1024.
[5]Horizontal by vertical.
[6]Listed in order of preference.
[7]Optional.
[8]Black-and-white only.

to pay about $2000 for a dual-page unit.

Speed and Sharpness

All the monitors in our Buyers' Guide come with a special video board that determines speed, resolution, and other important attributes.

For top performance, look for a board that has a graphics coprocessor. Speed varies widely depending on the type of coprocessor and on several other factors. The best way to



All the lines and borders should be square, not warped and wobbly like you see here.

Maximum gray levels	Square pixels	Windows 3.0 driver	GEM driver	DISPLAY STANDARDS[6] VGA	HGC	EGA	CGA	MDA	Non-interlaced	Refresh rate (Hz)	Nonglare screen	Warranty (years)	Reader service no.
4	Y	Y	N	N	Y	N	N	N	Y	77	Y[7]	1	655
16	Y	Y	N	Y	Y	Y	Y	N	Y	75	Y[7]	1	655
0[8]	N	Y	Y	N	Y	N	N	Y	Y	68	Y[7]	3	656
64	Y	Y	Y	Y	N	N	N	N	N	43.5	Y	1	657
16	Y	Y	Y	Y	N	N	N	N	N	49	Y	1	657
256	Y	Y	Y	Y	Y	Y	Y	Y	Y	80	Y[7]	1	658
2	Y	Y	Y	N	N	N	N	N	Y	77	Y	1	659
2	Y	Y	Y	N	Y	N	N	N	Y	66	Y	1	659
16	Y	Y	Y	Y	Y	Y	Y	Y	Y	77	Y	1	659
0[8]	Y	Y	Y	N	Y	N	Y	Y	Y	75	Y[7]	1	660
256	Y	Y	Y	Y	N	Y	Y	N	Y	75	Y[7]	1	660
0[8]	Y	Y	Y	Y	Y	Y	Y	Y	Y	66	Y[7]	1	660
0[8]	Y	Y	Y	Y	Y	Y	Y	Y	Y	66	Y[7]	1	660
0[8]	Y	Y	Y	Y	Y	Y	Y	Y	Y	70	Y[7]	1	660
256	Y	Y	Y	N	N	N	Y	N	Y	70	Y	1	661
2	Y	Y	Y	N	Y	N	N	N	Y	64	Y	1	662
2	Y	Y	Y	Y	Y	Y	Y	Y	Y	60	Y	1	663
2	Y	Y	Y	Y	Y	Y	Y	Y	Y	73	N	1	664
2	Y	Y	Y	Y	Y	Y	Y	Y	Y	73	N	1	664
2	Y	Y	Y	Y	Y	Y	Y	Y	Y	73	N	1	664
2	Y	Y	Y	Y	Y	Y	Y	Y	Y	73	N	1	664
2	Y	Y	Y	N	Y	N	N	N	Y	64	Y	1	665
256	Y	Y	Y	Y	N	Y	Y	N	Y	70	N	1	665
4	Y	Y	Y	N	Y	N	N	Y	Y	63	Y	1	666
4	Y	Y	Y	N	Y	N	N	Y	Y	72	Y[7]	1	667
4	Y	Y	Y	N	Y	N	N	Y	Y	72	Y[7]	1	667
0[8]	Y	Y	Y	N	Y	N	N	Y	Y	72	Y[7]	1	667
0[8]	Y	Y	Y	Y	N	Y	Y	N	Y	72	Y[7]	1	667
0[8]	Y	Y	Y	N	Y	N	N	Y	Y	73	Y[7]	1	667
0[8]	Y	Y	Y	Y	N	Y	Y	N	Y	73	Y[7]	1	667
256	Y	Y	Y	N	Y	N	Y	Y	Y	73	Y[7]	1	667
0[8]	N	Y	Y	N	Y	N	N	N	N[10]	64	Y	1	668
2	Y	Y	Y	Y	Y	Y	Y	Y	Y	63	Y	1	669
2	Y	Y	Y	Y	N	Y	Y	N	Y	63	Y	1	669
16	Y	Y	Y	N	N	N	Y	N	Y	66	Y	1	670
16	Y	Y	Y	N	N	N	Y	N	Y	66	Y	1	670
16	Y	Y	Y	Y	Y	Y	Y	Y	Y	66	Y	1	671

[7]Price does not include controller board.
[10]Noninterlaced only with HGC and at 1280 x 960.
[11]Price includes WY7500 cord.

For more information about all products in this table, circle reader service no. 907.

determine how fast the board will run is also the most obvious: Give it a real-world test with your desktop publishing program of choice.

Resolution, which determines the type size you can read and the amount of the page you'll be able to see, is another key point of comparison. It's usually described in terms of how many pixels (the dots composing the image) will fit on the screen. The greater the number of pixels, the sharper the image.

If you're comparing monitors of different sizes and shapes, however, resolution measurements such as 1024 by 1280 start to lose their meaning. A more useful way to describe resolution is in pixels per inch (often referred to as dots per inch, or dpi); only this can tell you whether the resolution of one monitor is finer than that of another. We've included this specification in the Buyers' Guide tables.

Ideally, you should find a screen with square pixels, like those popularized by Apple's Macintosh and adopted in IBM's VGA display standard. Without square pixels, if you turn a font, circle, or other element sideways, that element may appear stretched or otherwise distorted.

Another issue to consider is gray-scale resolution. If you frequently drop scanned photographs into your documents, look for a monitor that displays a variety of shades between black and white. Note, however, that prices for similar products rise quickly with the number of grays (256 is usually the maximum).

Compatibility Checklist

The maximum resolutions of the monitors in this guide do not match any of the common graphics standards. That means you can't be sure whether a monitor will run at maximum resolution with

Some call this mapping
why Tucson didn't mee

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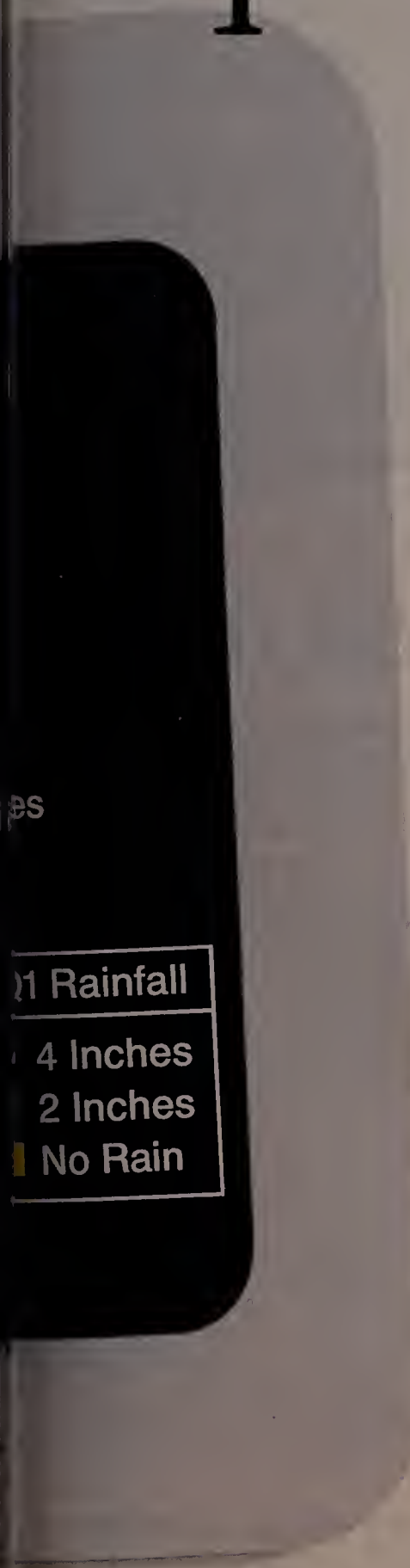

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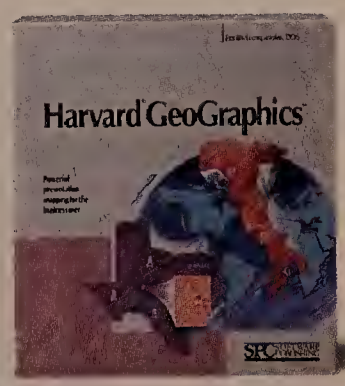
The technique is called mapping. But we think you'll call it just plain smart.



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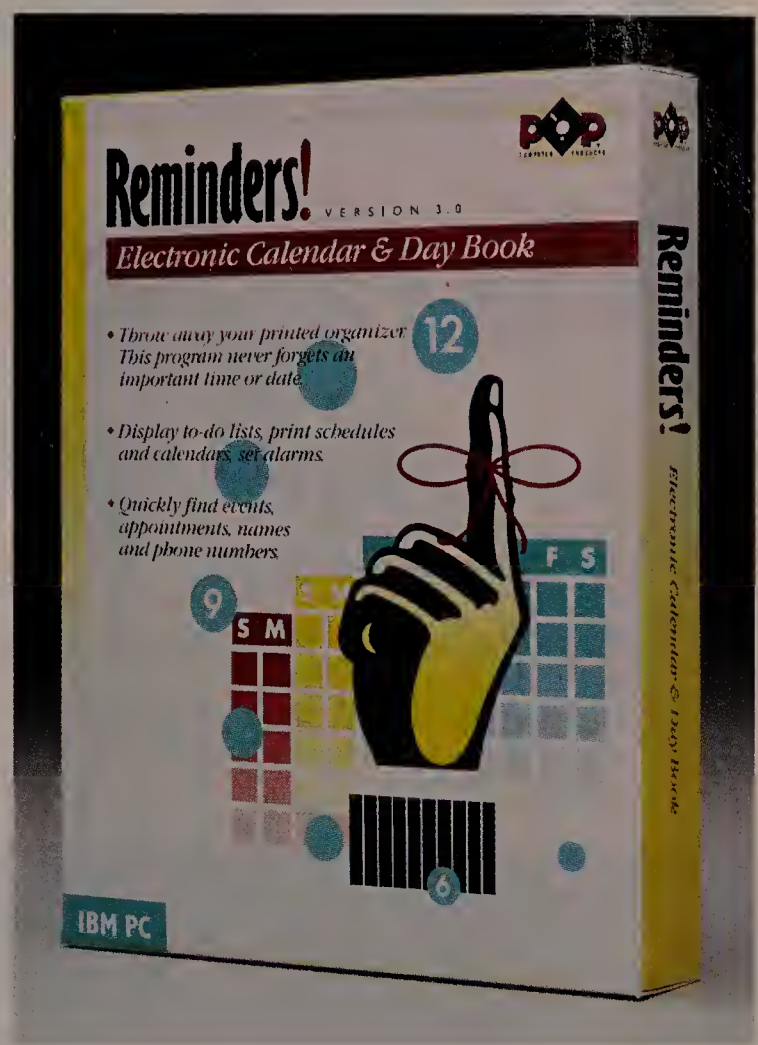
Which also keeps you out of trouble.

Reminders lets you organize and plan your calendar as far into the future as you want to go. So you need never miss an important meeting, appointment, birthday, anniversary, or any of the countless items on everyone's personal and professional agenda. And to make absolutely certain you'll never forget anything you need to remember, Reminders lets you set alarms at any time, on any date to jog your memory.

Reminders lets you organize all your phone numbers, and gives you all the space you need to make notes, add names, or do anything important right in the program's phonebook. Reminders will even dial a phone number for you.

Reminders also makes your life easier by allowing you to organize your tasks into manageable groups with a feature called "Categories". The "Log" feature lets you keep permanent records of past tasks and events. And Reminder's "Print" feature allows you to make anything in the program portable. So you don't have to stay in your office to stay organized.

Reminders also includes features that insert regular events into your schedule automatically, word search capabilities, a "Memory Jogger" feature that carries any undone tasks over to the next day, and a built-in alarm system that alerts you when you schedule an event that conflicts with something you already have planned.



And if you can't remember where you filed something, all you have to do is type in a key word or a few key words relevant to what you're looking for, and Reminders' "Word Search" feature will find the subject for you no matter where you filed it.

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POP Computer Products, Inc., PO. Box 1389, Evergreen, CO. 80439 Technical Requirements: Computer – IBM PC, PS, or 100% compatible computers. Memory – 275K of available RAM; resident portion is 6K. DOS – PC or MS DOS v 2.0 or higher. Display – Monochrome or color monitors using CGA, EGA or VGA.

Circle 218 on reader service card

Marketing Meets Desktop Publishing

When a New England health care consulting group needed an effective way to market its services, a regionally targeted, desktop published newsletter proved to be just the answer.

Reynold Spadoni (right), Ernst & Young consultant and founding editor of the newsletter, says the publication has heightened client awareness of the firm's many services.

RICHARD HOWARD

Alice LaPlante

How do you let potential customers know about new services without alienating them with slick advertising hype? That was the issue facing Reynold Spadoni, manager of Ernst & Young's Health Care Consulting Group in Boston. The firm had dramatically expanded its consulting services to cover a range of health care management issues but found that many hospital executives were unaware of Ernst & Young's offerings and were turning to its competitors instead.

Ernst & Young had traditionally provided a variety of financial consulting services to hospitals and other medical institutions, everything from feasibility studies on upcoming legal and regulatory changes to advice on dealing efficiently with third-party health care providers. But over the past ten years, the firm expanded its focus. Consultants now assist clients in areas such as the design, maintenance, and installation of strategic computer systems, as well as with problems like how to improve the

The Bottom Line

Problem

Ernst & Young's New England Health Care Consulting Group needed a low-key way of publicizing its many services and attracting new clients.

Solution

A regionally targeted newsletter written and designed by Ernst & Young consultants on hot topics in the health care industry.

Benefits

Greater exposure of consultants' expertise; increased client inquiries about Ernst & Young services.

RICHARD HOWARD

By using a low-end desktop publishing package, Ernst & Young consultants can put out their newsletter without a huge investment in hardware or training.

efficiency of emergency room facilities.

"We wanted to spread the word," says Spadoni.

The vehicle for getting the word out had to meet two criteria: It needed to be geared toward the New England health care market, and it needed to be more informational than sales oriented.

"New Englanders think they are different from everyone else, and we wanted to cater to this way of thinking," says Spadoni, adding that unlike in other regions of the country, the health care industry in New England is very close knit. "Word-of-mouth marketing is therefore key to success in this market—much more than traditional advertising or marketing strategies," he explains.

Low-Key Approach

After brainstorming with colleagues, Spadoni decided on a quarterly newsletter—to be designed, written, and produced by Ernst & Young consultants familiar with hot topics in the health care industry. The strategy was to create a publication that would educate New England hospital executives on critical health care management issues and at the same time market Ernst & Young's many services.

Newsletters are a favorite marketing tool of all the major health care consulting firms, which produce a variety of national publications for hospital executives. None of the national firms, however, offer regionally targeted newsletters. And most of the publications are simply advertising or promotional literature "disguised" as newsletters, says Spadoni—a ploy that isn't lost on Ernst & Young's highly educated clientele.

Ernst & Young has never set specific quotas for new business resulting from the newsletter—viewing the publication instead as a means of attracting clients indirectly, through greater exposure. Like many consulting firms, Ernst & Young has no sales force per se; each consultant is responsible for generating business and bringing in new clients. Spadoni says that giving consultants the opportunity to write articles in their area of expertise helps promote the firm's most valuable asset: its people. And consultants who've written for the publication say the low-key approach has paid off.

"When I go out to client sites, the clients have the newsletter sitting on their desks, and they comment on the articles they've read in past issues," says consultant Ron Crandall, who recently took over as editor of the publication.

The Premier Issue

Called *New England Chief Executive*, the first newsletter was mailed in April 1990. The premier issue was eight pages long and included an interview with a leading hospital administrator, as well as advice on tax and financial planning. One article discussed how hospitals can maximize depreciation on capital assets for the greatest tax benefits; another offered tips on making financial projections in the face of state regulatory changes. Subsequent issues have included major features on "total quality management" theories and practice and on retirement communities or long-term care as a potential source of reve-

nue for New England hospitals and medical centers.

New England Chief Executive is mailed quarterly to 1000 top hospital executives in five New England states: Massachusetts, Vermont, Connecticut, New Hampshire, and Maine. It costs Ernst & Young $1500 for printing and mailing.

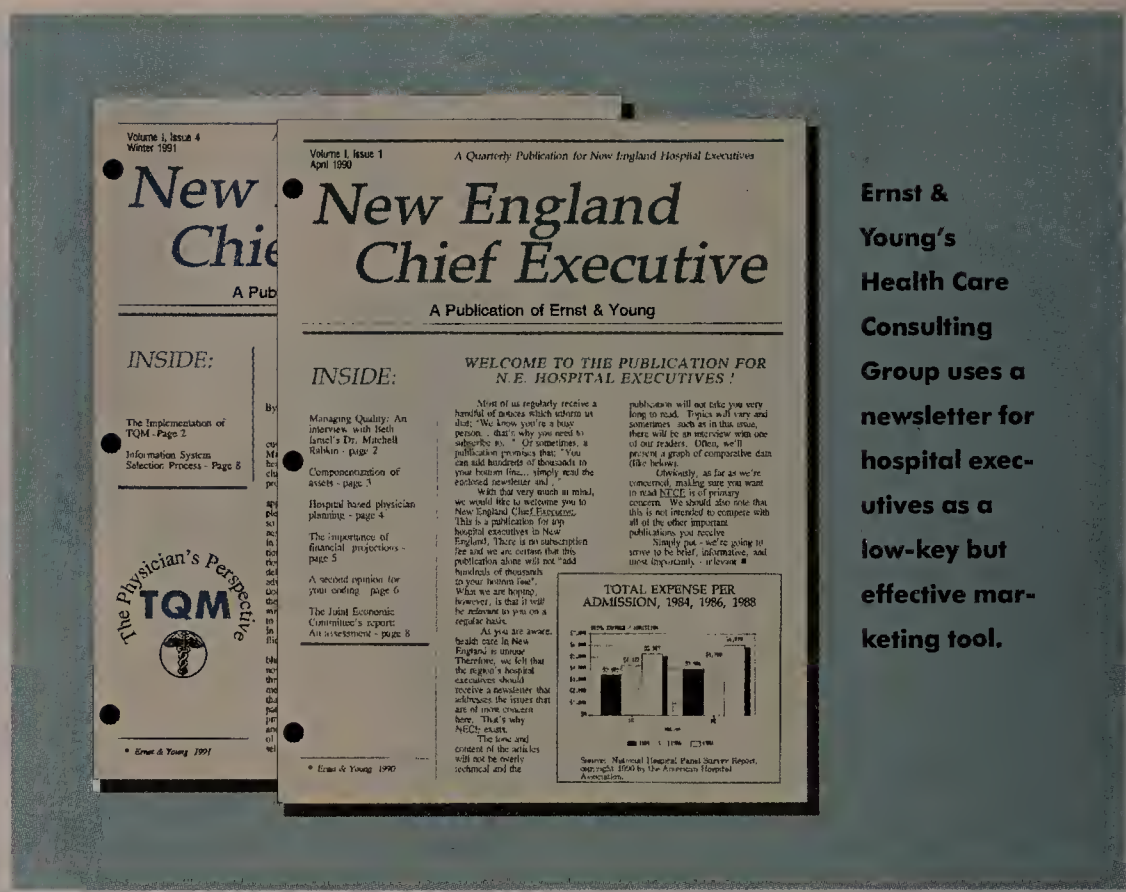
Spadoni, who had no graphics design or desktop publishing experience, was responsible for getting the newsletter project off the ground. After researching the alternatives, he decided almost immediately to go with an inexpensive, easy-to-use package: Power Up's *Express Publisher.*

The low-end approach made sense for two reasons, says Spadoni. While the project was still in the experimental phase, he didn't want to invest a lot of money in a high-end package. And perhaps more important, with no desktop publishing experience, he wanted something he could pick up easily and begin using productively after a minimum amount of training. "Until that point, I'd spent 90 percent of my time using *1-2-3* spreadsheets, and the whole graphics arena was a brand-new frontier for me," says Spadoni.

Turning Readers Into Clients

A note in each issue advises readers to direct requests for additional information to the newsletter editor. The editor then funnels questions about articles through Ernst & Young's preestablished contact-tracking system, which ensures that inquiries get forwarded to the appropriate partner in the appropriate regional office.

And a lot of inquiries have come in, says Spadoni. The cover story in the fall 1990 issue on the subject of continuing-care retirement communities (a service that many hospitals are considering) attracted a lot of attention. Several hospital executives called to request additional copies of the newsletter to distribute to their boards of directors. You can't buy that type of exposure.


Volume 1, Issue 4
Winter 1991

New Chie

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INSIDE:

The Implementation of TQM - Page 2

Information Systems Selection Process - Page 8

The Physician's Perspective TQM

Ernst & Young 1991

Volume 1, Issue 1
April 1990

A Quarterly Publication for New England Hospital Executives

New England Chief Executive

A Publication of Ernst & Young

INSIDE:

Managing Quality: An interview with Beth Israel's Dr. Mitchell Rabkin - page 2

Componentization of assets - page 3

Hospital based physician planning - page 4

The importance of financial projections - page 5

A second opinion for your ending page 6

The Joint Economic Committee's report: An assessment - page 8

WELCOME TO THE PUBLICATION FOR N.E. HOSPITAL EXECUTIVES !

Most of us regularly receive a handful of notices which inform us that: "We know you're a busy person... that's why you need to subscribe to..." Or sometimes, a publication promises that: "You can add hundreds of thousands to your bottom line... simply read the enclosed newsletter and..."

With that very much in mind, we would like to welcome you to New England Chief Executive. This is a publication for top hospital executives in New England. There is no subscription fee and we are certain that this publication alone will not "add hundreds of thousands to your bottom line".

What we are hoping, however, is that it will be relevant to you on a regular basis.

As you are aware, health care in New England is unique. Therefore, we felt that the region's hospital executives should receive a newsletter that addresses the issues that are of more concern here. That's why NECE exists.

The tone and content of the articles will not be overly technical and the publication will not take you very long to read. Topics will vary and sometimes, such as in this issue, there will be an interview with one of our readers. Often, we'll present a graph of comparative data (like below).

Obviously, as far as we're concerned, making sure you want to read NECE is of primary concern. We should also note that this is not intended to compete with all of the other important publications you receive.

Simply put - we're going to strive to be brief, informative, and most importantly - relevant ■

TOTAL EXPENSE PER ADMISSION, 1984, 1986, 1988

Source: National Hospital Panel Survey Report, copyright 1990 by the American Hospital Association.

Ernst & Young 1990

Ernst & Young's Health Care Consulting Group uses a newsletter for hospital executives as a low-key but effective marketing tool.

Moving On: The Second Year

With a year and a half of experience under their belts, consultants at Ernst & Young are reevaluating their approach to newsletter design and content and looking for new ways to capitalize on this low-key approach to marketing.

Spadoni has handed the editorship over to two consultants. Crandall, who's written several articles, handles the editorial side, while Donna Schiavo is responsible for newsletter production and design. The position will be rotated among Ernst & Young consultants each year to keep the publication fresh and keep consultants from getting too bogged down by the added work load, explains Spadoni.

Several changes are in the works. The two new editors are trying out story ideas—and dropping stories that haven't generated much reader response. One idea that didn't work, for example, was in-depth interviews with regional hospital executives. "That wasn't as popular as it might have been," says Crandall, "so we're phasing it out. [Instead,] we'll be interviewing a range of hospital executives on a given topic—sort of an informal survey. This has a dual objective," he adds. "It gives us an excuse to knock on doors."

But Ernst & Young isn't stopping at newsletters. "Now we see the newsletter as part of a larger strategy in which we produce a wide range of marketing literature that illustrates the kinds of services we provide," says Spadoni.

Schiavo, for example, is developing a series of newsletter inserts that will spotlight key Ernst & Young health care consultants and include photos and brief synopses of their specialties. The inserts will tell readers how to contact the featured consultants.

"The primary goals are to get the name of Ernst & Young consultants out and to highlight [our] broad spectrum of services," says Schiavo. She adds that the most successful articles—judging from reader calls and letters—are the ones in which Ernst & Young consultants provide concrete advice in their field of expertise.

"The newsletter has definitely made us more visible," says Crandall. "When I go out to a consulting site, clients mention it. I'd say it has more than fulfilled its purpose. Our job now is to take it even further."

Alice LaPlante is a freelance writer in Palo Alto, California.

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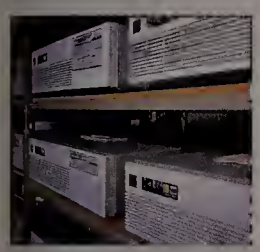

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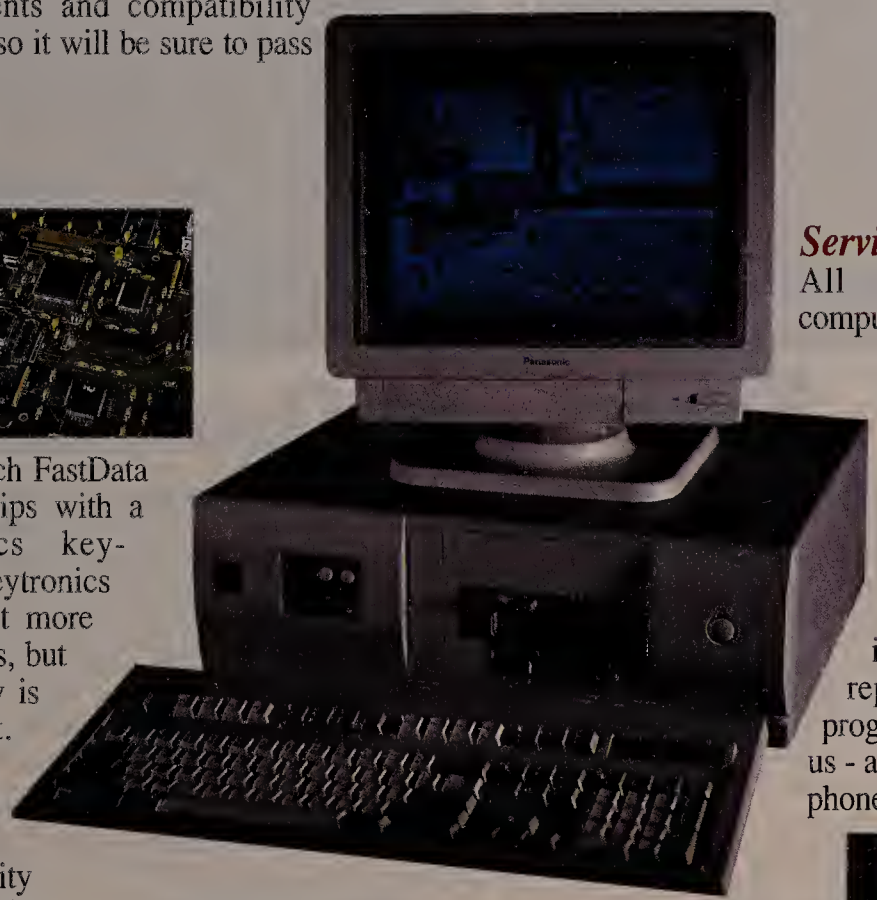
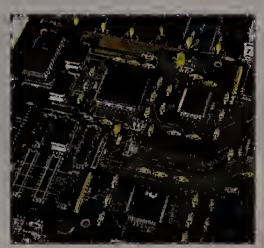


Better Components.



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Selection.

Our face to face retail background has made us never forget that the customer comes first and that a personal computer is just part of a customer's overall needs. That's why FastMicro offers thousands of hardware and software products to enhance your new personal computer. In fact, our competition will probably tell you to call us when you need something to run on their personal computer.

Risk Free.

We pass the test for the choosiest of customers; in fact, FastMicro sells to over half of the Fortune 500 and Universities in 47 states (we're working on the rest). These people buy for a living and rely on us, you can too. You can do more than take our word on it - go ahead and purchase any FastData brand product from FastMicro and if you are not thoroughly satisfied after 30 days, you can return it for a full refund of the purchase price.

FastData 386 Systems

FastData 386/33 $2399

The fastest 386 processor available combined with a 64K thirty nanosecond memory cache make the FastData 386/33 a power users dream! Included in the base price is a 100 megabyte 20 millisecond hard disk, 1024 by 768 VGA monitor and card, four megabytes of memory, and 5.25" & 3.5" high capacity floppy drives. Plus, should anything ever go wrong with your FastData computer, you are covered by a one-year warrantee with free on-site service or system replacement if we cannot correct the problem with our FastSHIP advance parts replacement program.

Standard Features

- ✓ 33mhz Intel 386-DX processor.
- ✓ 64K high-speed memory cache.
- ✓ 4 megabytes high speed RAM.
- ✓ 100 mb 20ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" and 1.44mb 3.5" floppy drives.
- ✓ Full size (shown) or standard size chassis with keylock and reset buttons.
- ✓ 387-DX coprocessor socket.
- ✓ 230 watt power supply.
- ✓ 14" Super VGA color monitor, 1024x768 resolution, with 16 bit VGA card with 1mb Video Ram.
- ✓ Clock calendar, parallel port, game port and two serial ports.
- ✓ Keytronics 101 key keyboard.
- ✓ 8 expansion slots & 5 drive bays.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ Windows & Mouse add $99.
- ✓ FCC Class B approved.

386/33	80 IDE	100 IDE	200 IDE	330 ESDI
Mono	$2,009	$2,089	$2,399	$3,159
VGA White	$2,109	$2,189	$2,499	$3,259
VGA Color	$2,259	$2,339	$2,649	$3,409
VGA 1024	$2,319	$2,399	$2,709	$3,469

FastData 386/25 $1999

The optimum combination of features, expandability, and power make the FastData 386/25 an ideal choice for those whose applications demand high speed 32 bit processing and expandability. The value of the 386/25 goes far beyond its price; it comes configured with a a full four megabytes of fast RAM, a quick 22 millisecond 65 megabyte hard disk, and maximum VGA displaying 1024 by 768 resolution powered by a high-output 16 bit 512K VGA board. Also, the FastMicro team will configure your FastData 386 exactly the way you want, without sending you shopping elsewhere.

Standard Features

- ✓ 25mhz Intel 80386-DX.
- ✓ 4 megabytes of high speed RAM.
- ✓ 80 mb 20ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" or 1.44mb 3.5" floppy drive. (For both add $69)
- ✓ Standard chassis (shown on left) with keylock, speed and reset buttons.
- ✓ 80387-DX coprocessor socket.
- ✓ 200 watt power supply
- ✓ 14" Super VGA color monitor, 1024x768 resolution, with 16 bit VGA card with 1mb Video Ram.
- ✓ Clock calendar, parallel port, two serial ports, and game port.
- ✓ Keytronics 101 key keyboard.
- ✓ 8 expansion slots & 5 drive bays.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ Windows & Mouse add $99.
- ✓ FCC Class B approved.

386/25	40 IDE	80 IDE	100 IDE	200 IDE
Mono	$1,539	$1,689	$1,769	$2,079
VGA White	$1,639	$1,789	$1,869	$2,179
VGA Color	$1,789	$1,939	$2,019	$2,329
VGA 1024	$1,849	$1,999	$2,079	$2,389

FastData 486/25

Call about our hot 486, just $3,099 with the same standard features as our 386-33 system. Includes a 128K two-stage cache and is expandable to 64mb of memory.

All FastData Systems Include:

- 30 day money- back guarantee
- Toll-free technical support for life
- One year warrantee with on-site service available to most U.S. locations

FastData SX Systems

$1599 FastData SX/20

25% faster than a 16mhz SX, the FastData SX/20 adds even greater performance to its 386 multitasking capabilities. Just $200 more than our SX/16, this machine also includes a second floppy drive in addition to the standard VGA color monitor and 16 bit VGA adaptor, Keytronics keyboard and 40 megabyte hard drive. The system includes two megabytes of memory and is expandable to eight on the main system board. Remember, when you have questions, need to solve a problem, or want recommendations on products for your system, the FastMicro team is standing by toll-free to provide product support for as long as you own your FastData personal computer.

Standard Features

- ✓ 20mhz Intel 80386-SX processor.
- ✓ 2 megabytes of high speed RAM.
- ✓ 40 mb 28ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" and 1.44mb 3.5" floppy drives.
- ✓ Standard chassis (shown) with keylock, speed and reset buttons.
- ✓ 200 watt power supply
- ✓ 14" Super VGA color monitor with 16 bit VGA card with 512K.
- ✓ Clock calendar, parallel port, two serial ports, and game port.
- ✓ Keytronics 101 key keyboard.
- ✓ 8 expansion slots, 5 drive bays.
- ✓ 80387-SX coprocessor socket.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ Windows & Mouse add $99.
- ✓ Guaranteed compatible.
- ✓ FCC Class B approved.

SX/20	40 IDE	80 IDE	100 IDE	200 IDE
Mono	$1,289	$1,439	$1,519	$1,829
VGA White	$1,389	$1,539	$1,619	$1,929
VGA Color	$1,539	$1,689	$1,769	$2,079
VGA 1024	$1,599	$1,749	$1,829	$2,139

$1399 FastData 386/SX

Combine the benefits of an advanced Intel 386 processor, the value of a 286 and the advantages of FastData and you've got the FastData 386/SX! This machine is the choice of those who want to run today's powerful 386 and multitasking software, like Windows, and also want to run their favorite DOS applications at surprising speeds. We've made our customers' favorite options standard: it comes with an ample two megabytes of memory, a high performance 40mb hard drive, and 16 bit color VGA. Compare performance, features, and service and you will find no better SX value. Interested further? Try the FastData 386/SX for 30 days; you have to be happy - if not, we'll take it back.

Standard Features

- ✓ 16mhz Intel 80386-SX processor.
- ✓ 2 megabytes of high speed RAM.
- ✓ 40 mb 28ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" or 1.44mb 3.5" floppy drive. Both add $69.
- ✓ Standard chassis with keylock, speed and reset buttons (mini desktop shown - add $50).
- ✓ 200 watt power supply
- ✓ 14" VGA color monitor with 16 bit VGA card with 256K.
- ✓ Clock calendar, parallel port, two serial ports, and a game port.
- ✓ Keytronics 101 key keyboard.
- ✓ 8 expansion slots, 5 drive bays.
- ✓ 80387-SX coprocessor socket.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ Windows & Mouse add $99.
- ✓ Guaranteed compatible.
- ✓ FCC Class B approved.

386/SX	40 IDE	80 IDE	100 IDE	200 IDE
Mono	$1,149	$1,299	$1,379	$1,689
VGA White	$1,249	$1,399	$1,479	$1,789
VGA Color	$1,399	$1,549	$1,629	$1,939
VGA 1024	$1,459	$1,609	$1,689	$1,999

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Hardware

DISK DRIVES

Colorado DJ-10 40-120mb Int. Tape 249
DJ-20 80-240mb Int. Tape 319
Conner *(see IDE controllers below)*
CP3044 40mb IDE 28ms 269
CP3104 100mb IDE 25ms 499
CP3208 200mb IDE 25ms 849

Seagate 89mb AT Kit

$399 IDE performance, big 89 megabyte capacity and Seagate quality make this kit a great buy. A 19ms access time and 5 mbps transfer rate assure great performance. Controller, cables and rails are included to make installation fast and easy.

Micropolis
MC1664 340mb ESDI 14ms 1295
MC1598 1.2gb SCSI 14ms 2895
NEC CDR-3501 Ext. CD-ROM w/interface 549
Plus Development
HardCard IIXL 50 - 52mb 9 ms 16bit 399
HardCard IIXL 105 - 105mb 9 ms 16bit 679
Impulse 42mb 12 ms 16bit IDE Kit 399
Impulse 105mb 9 ms 16bit IDE Kit 599

Toshiba 1.44mb Floppy Drive $69

Complete with mounting brackets and installation instructions, this Toshiba works in all true 286 & 386 compatibles. Will also read/write/format 720K 3.5" disks. Rails, add $5.

Seagate
30MB XT Kit ST238 w/ cont. 249
40MB AT ST251-1 MFM Drive 239
40MB AT ST157A 28ms IDE Drive 199
80MB AT ST296N SCSI Drive w/adaptor 349
89MB ST1102A 19ms IDE Drive 359
125MB ST1144A 19ms IDE Drive 469
210MB ST1239A 15ms IDE Drive 799
330MB ST2383E 16ms ESDI Drive 1289
Teac
1.2MB 5.25" Floppy 65
1.44MB 3.5" Floppy 65

Toshiba 100mb IDE Kit $489

Upgrade your 286 or 386 to IDE technology and Toshiba quality at a FastMicro price. This kit comes with a fast 20ms 105mb drive and built-in 1:1 controller, 16 bit IDE card with dual floppy controller and cables, 5.25" brackets and rails. Call our experts for all your drive needs. Model MK234FC.

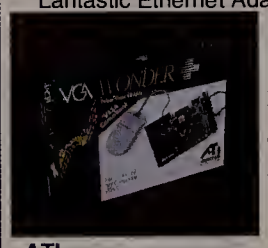
Toshiba
360K 5.25" Floppy (Black) 69
1.2MB 5.25" Floppy 69
1.44MB 3.5" Floppy 69
65mb MK134 22ms RLL drive 279
100mb MK234FC IDE 3.5" drive 449
Western Digital
WD 16 bit IDE Host - with dual floppy controller 39
WD93044 40mb IDE 28ms 199
WDAC280 80mb IDE 28ms 339
WE1007V-SE2 ESDI AT 1:1 dual controller 149

Sun Moon Star CD-ROM Drive

$549 Affordable CD-ROM technology is here! This player reads over 600mbs from just one CD and can even play your favorite audio CDs. Using a high quality Hitachi mechanism, it comes with a cable, interface and 18 month warrantee. Add an Illustrated Encyclopedia CD for $49.

BOARDS

Artisoft/Lantastic
Lantastic 2mbps Starter Kit - Two Station 369
Lantastic 2mbps Adaptor 169
Lantastic Ethernet Starter Kit - Two Station 499
Lantastic Ethernet Adaptor 239



ATI VGA Wonder + $189

New and improved, the ATI VGA *WONDER+* is faster than VRAM. It does interlaced and non-interlaced 1024x768 modes, is 100% register compatible, and comes with extensive software drivers. A free mouse is included as an added bonus. 512K version $219.

ATI
2400 ETC Internal ..... Call
2400 ETC External 187
9600/E External MNP V.42bis 479
VGA Basic 16 75
VGA Wonder + 256K 189
VGA Wonder + 512K 229
Brown Wagh Sound Blaster 149
Everex
2400B Int Modem 99
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Logitech
ScanMan Plus 165
Scanman 256 289
Orchid
ProDesigner II 512/1mb 279/329
Tiny Turbo 286 207
Tiny Turbo Xtra 267

Practical Modem 9600SA $449

This external modem features V.42 and MNP error correction combined with MNP/5 and V.42 bis data compression to provide total high speed throughput. The PM9600SA is also V.32 TCM, V.32, V.22 compliant and comes with a five year guarantee.

Paradise
Basic VGA - 8 bit 109
VGA 1024 256K/512K 175/199
Practical Peripherals
2400B Int Modem 125
2400B Int with MNP 169
PM9600SA Ext. V.32/V.42bis 449
Prometheus
Promodem 2400B Internal. 98
Promodem 2400G External 149
USRobotics
2400 Sportster Int/Ext. 119/147
2400 Sportster Int/Ext. 159/199
Courier HST 14,400 /Int.Ext. 539/579
Courier HST 14,400 Dual Standard Ext. 859
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VGA 1024i 512K 209
V-RAM VGA 512K 299
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2400 V.42bis External Modem 169
9624 Send/Receive Internal Fax Modem 129

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Mitsubishi
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Diamond Scan 1381 479
NEC
Multisync 2a 469
Multisync GS 2a 199
Multisync 3d 629
Multisync 4d ..... Call
Panasonic C1381 VGA 439
Princeton ..... Call
Seiko CM1440/1450 ..... 519/659
Sony 1304 Multiscan 669
Zenith 1492 ..... Call

FastData Products

FastData 16 Bit VGA

The FastData 16bit VGA card features 256K of video memory, does CGA, EGA, & VGA up to 1024x768 and comes with drivers for popular software including Windows 3.0. It's expandable to 512K and has a 30 day money-back guarantee.

$89 256K Vers.
$119 512K Vers.

FastData 16bit 1mb VGA 159
FastData CGA Card 35
FastData MGP Card 29

FastData 2400 Baud Internal Modem

$69 The FastData 2400 baud internal modem is fully Hayes compatible and can be configured to COM port 1-4. It has an internal speaker, is auto answer & auto dial, and comes with BitCom software.

9600B SendFax w/ 2400B Modem 99
MFM 16 Bit 1:1 Hard/Floppy Disk Cont. 59
Parallel/Dual Serial/Game Card 29
RLL 16bit 1:1 Hard/Floppy Disk Cont. 69
XT 1.44 Dual Floppy Controller 35

FastData Monitors

Your best value, we have a complete line made for us by leading manufacturers like Samsung & Hyundai. Like all FastData products, you have a full 30 day money back guarantee. Shown is the VGA Color for $279.

FastData Monitors
12" Amber Monochrome 79
14" Amber Monochrome 109
14" White Monochrome 109
14" White VGA Monochrome 129
14" CGA Color .52 dot pitch 199
14" VGA Color .39 dot pitch 269
14" VGA Color .31 dot pitch 319
14" Super VGA 1024 x 768i .28 dp. 349

PRINTERS

Canon BJ10E 319
BJ300/BJ330 ..... 495/Call

Citizen GSX140 $285

Loaded with features, this 24 pin printer is a hot seller! It comes with 6 resident fonts, paper parking, and Epson & IBM printing modes. It does up to 192 CPS and has a unique LCD control panel that lets you set everything without DIP switches. Upgrade to color anytime for just $39.

Citizen
200GX 189
GSX140 / GSX145 ..... 285/395
Fujitsu DL3400 359
NEC
P3200 269
P3300 369
P6200 469
P6300 629
OKIDATA Okilaser 400 669

NEC Silentwriter 2 Model 90 $1595

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KXP1123 ..... Call
KXP1624 429
KXP4420 Laser 829
KXP4450/4455 Lasers ..... Call
Seiko Smart Label Printer 167
Star
NX1001 149
NX1500 299
NX2410 219
XB2410 / 2415 ..... 429 / 569
Texas Instruments Microlaser PS17 1199
Microlaser PS35 1499

FastData 286/12 $799

Imagine a fast 286 computer at a super price and you've got the FastData 286/12. This system is complete, not stripped. You get one megabyte of zero-wait-state memory and a 28ms IDE hard disk - standard. Also included is an amber monitor and graphics card, your choice of a high density 1.2mb or 1.44mb floppy drive and a Keytronics keyboard. And since its a FastData, you are backed with toll-free technical support, one year warranty with the FastShip replacement program & on-site service plan, and our 30 day full money back satisfaction guarantee!

- ✓ 12mhz 80286 processor.
- ✓ 1 megabyte RAM.
- ✓ 40 mb 28ms hard disk 1:1 interleave.
- ✓ 1.2mb 5.25" or 1.44mb 3.5" floppy drive (2nd drive add $69)
- ✓ Standard chassis
- ✓ Five drive bays.
- ✓ 200 watt power supply.
- ✓ *287XL* coprocessor socket
- ✓ Monochrome monitor with monochrome graphic board.
- ✓ Clock calendar, parallel port, and two serial ports.
- ✓ Keytronics enhanced 101 keyboard.
- ✓ 8 expansion slots, 6 available.
- ✓ Full documentation.
- ✓ FCC Class B approved.

System Price	40mb	65mb	80mb	100mb
Monochrome	$799	$869	$999	$1,069
VGA Color	$1,099	$1,169	$1,299	$1,369
VGA 1024	$1,199	$1,269	$1,399	$1,469

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Software

DATABASE & FORMS

askSam 5.0 209
Avery List & Mail Plus 37
Clarion Personal Developer 45
Clarion Professional Developer 449
Clipper 5.0 489
DataEase 459

Personal R:Base $89

Who's says powerful relational databases are expensive. Not with the new easy-to-use Personal R:Base. It has intuitive pull-down menus that let you query your data, build quick forms and reports automatically and even build applications without complex programming.

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dBase IV 479
dBXL Diamond 129
Formbase 299
FormTool Gold 52
Formfiller 85
Foxbase Plus 177
FoxPro 417
Paradox 3.5 489
Per:Form Designer & Filler 95
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Q & A 214
RapidFile 99
Rbase for DOS 447
Reflex 159

DESKTOP PUBLISHING

Adobe Postscript Cart. for HPLJ-II 279
db Publisher Professional 389
GEM Desktop Pub. 159
Pagemaker 4.0 489

Corel Draw Version 2.0 $359

Winner of all the top awards, Corel Draw gives you more for your money. It runs under Windows & includes incredible drawing and editing tools. Includes over 100 typefaces and 300 pieces of clipart. CorelTrace converts scanned art to smooth vector images in seconds. This is the most complete illustration package we've ever seen!

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Printshop 33
Publisher's Paintbrush 149
Publish It! 135
Ventura Publisher Gold / Windows 539

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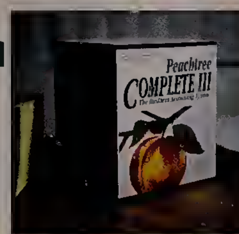
Bedford Integrated Acct. 119
DAC Accounting 4.1 79
DAC Bonus Pack 4.1 119
DAC Payroll 4.1 57
Dollars & Sense 98

Peachtree Complete III $139



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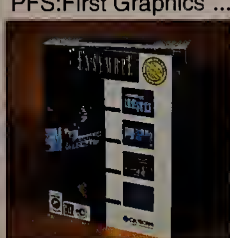

GeoWorks Ensemble $115

GeoWorks is the entry-level graphical environment that's received rave reviews. Includes GeoWrite word processor & desktop publisher, GeoDraw object-oriented drawing package, and GeoComm communications package. Also comes with GeoManager, GeoPlanner and GeoDex applications. Plus all programs operate with the same point & click simplicity (mouse required).

INTEGRATED

First Choice 95
Framework XE 95
Geoworks Ensemble 115
LotusWorks 89
SmartWare II 417
Symphony 2.2 489
Works 89

MICE/INPUT

Keytronics KB101 Keyboard 59
Keytronics Professional Mouse 59
Logitech Mouseman Serial righthand 65
Logitech Mouseman Serial w/Windows 127
Logitech Mouseman Bus righthand 76

Logitech Mouseman Serial $65

Logitech's MouseMan is the next step in mouse evolution. Specifically tailored in right or left hand versions, it provides maximum comfort and 400 DPI hardware resolution. Includes MouseWare utilities and Lifetime Warranty. Specify right or left, for PaintShow, add $15.

Logitech Mouseman Cordless 129
Logitech Trackman Serial 75
Microsoft Serial or Bus Mouse only 83
Microsoft Serial or Bus w/ paint 95
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Excel for Windows 299
Lotus 1-2-3 version 2.2 325
Lotus 1-2-3 version 3.1 399

Excel 3.0 for Windows $299

The best graphical spreadsheet now includes Toolbar, which puts frequently used commands a single mouse click away. New Q + E lets you access remote databases & Best Fit automatically resizes columns to display longer cell widths. 3-D charts, clip art support, and button macros are included too! Command level on-screen help for transitional 1-2-3 users is included too.

Lucid 3-D 53
Quattro Pro 2.0 Competitive Upgrade 89
Supercalc 5D 289

WORD PROCESSORS

Facelift for WordPerfect 57
Grammatik IV 49
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Multimate 4.0 267
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Publisher's PowerPak for WordPerfect 45
Rightwriter 58

WordPerfect 5.1 $239

WordPerfect is the #1 rated word processing software. Its got almost every feature imaginable and yet it is easy to use. The current version adds pull-down menus, mouse support, table creation and equation editor. Add this to the best software support in the business and you can't go wrong!

Sprint 117
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WINDOWS SOFTWARE

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Ami 115
Ami Professional 287
Asymetrix Toolbook 279
Bitstream Facelift 57
Corel Draw 2.0 359

Windows 3.0 $89

Turn your 286 or above with 640K or more of memory into a powerful multitasking workstation that runs even non-Windows applications. Includes many integrated applications standard. Plus, if you buy Windows now from FastMicro, we'll throw in 10 of the best Windows shareware programs.

DBfast/Windows 239
Excel 309
Form Publisher 139
Grammatik IV for Windows 49
HDC First Apps or Windows Express 46
Micrographix Draw + ... 149
Micrographix Designer 449
MicroPhone II 199
Microsoft Mouse w/ Windows 3.0 147
Microsoft Office (Word/Excel/Powerpoint) 619
Microsoft Productivity Pack 39
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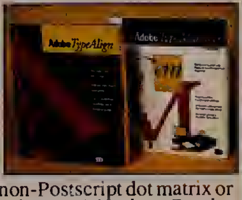
Project for Windows 429
Publisher's Powerpak for Windows 45
Windows 3.0 89
Windows Entertainment Pack 27
WingZ Spreadsheet 309
Word for Windows 299

Adobe Type Manager & Type Align $109 for both



Adobe Type Manager for Windows brings scalable PostScript® fonts to your screen and non-Postscript dot matrix or laser printer. Includes Times, Helvetica, Courier and Symbol font families. New Adobe TypeAlign for Windows works with ATM to create curved, skewed and other special type effects which you can import into other Windows applications.

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Aircraft & Scenery Designer 27
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NFL Challenge 55
PC Globe or PC USA 35
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Tetris 19

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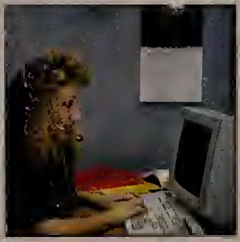

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XTree Gold 2.0

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Financial
Financial Oblique
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Journal Oblique
Journal Bold
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Circle 177 on reader service card

Button-Down Macros With Excel 3.0

Two of Excel 3.0's hottest features—the macro button and auto-open function—deliver on the promise of macros to make complex tasks simple.

Ralph Soucie

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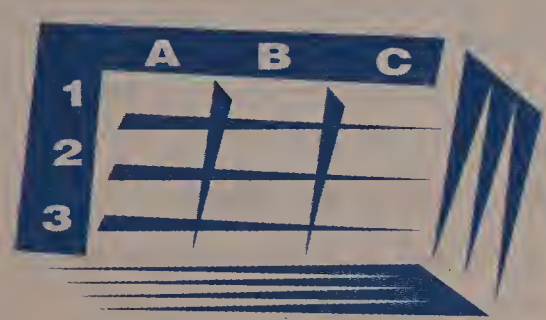

Spreadsheets

Put to their best use, macros do more than save keystrokes. They allow managers to delegate time-consuming tasks to assistants with less technical expertise. But as you load your worksheets with more macros, you may reach a point of diminishing returns. Eventually your subordinates could get bogged down in a morass of cobbled-together macros, hot keys, and complicated instructions.

Version 3.0 of *Excel* includes two devices that simplify macros for nontechnical users—the macro button and auto-open feature. You can now create macro buttons in *Excel* worksheets—graphical objects that you link macros to. Auto-open loads macro sheets that are ready for execution. If you take advantage of these features, one of your assistants can run a macro simply by opening a worksheet and clicking the mouse pointer on the corresponding button.

We'll show you how to create a working macro button to consolidate data from four sample financial worksheets. The instructions assume some familiarity with *Excel* macros.

▶ The Scenario

Each month you receive financial reports in *Excel* worksheets from each of your company's four regions (East, West, North, and South). Consolidating the data from these reports is an ideal task to pass on to your assistant. The first step is to make a simple summary worksheet. The key element of the sum-

mary sheet is a macro that automatically opens all the regional worksheet files and calculates company totals for the month.

▶ Creating the Sample Data

To create the macro, you must first create some sample data for each region. Start by opening a brand-new worksheet. Enter the titles **Department** and **Sales** in cells A1 and B1, respectively. Label cells A3 through A6 with the following department names: **Furniture**, **Appliances**, **Audio**, and **Video**. Fill cells B3 through B6 with the sample sales figure of $1000.

In cell B8, you need the total value of cells B3 through B7, and *Excel 3.0*'s auto-sum button (designated by the Greek letter sigma [Σ] on the tool bar) is the simplest way to make the formula. Click on cell B8, then click on the auto-sum icon twice. The formula in the edit bar will read '=SUM(B3:B7)', and cell B8 should now display $4000. Save the worksheet under the name EAST.XLS. Then use *File Save as* to save the file three more times under the file names NORTH.XLS, SOUTH.XLS, and WEST.XLS.

You now have four worksheets with the same format, each one corresponding to a sales region. To create the summary worksheet, you need five new columns. First, clear column B: Highlight it, press <**Delete**>, and select *OK*. Label cells B1 to F1 as **East**, **North**, **South**, **West**, and **Totals**, respectively. In the Totals column, click on cell F3, click on the auto-sum icon, use the mouse to highlight cells B3 to E3, and click on the auto-sum icon again. The formula should read '=SUM(B3:E3)'. Copy the SUM formula to F5:F6. To create totals for each column in row 8, select cell F8 and drag the pointer to cell B8 (not vice versa) so that F8 is still the active cell, double-click on the auto-sum icon to total column F, then press <**Ctrl**>-<**Enter**>.

Save the worksheet under the file name TOTSALES.XLS, then close all other files.

```
Consolidate_Sales
=OPEN("EAST.XLS")
=SELECT("R3C2:R6C2")
=COPY()
=FILE.CLOSE()
=SELECT("R3C2:R6C2")
=PASTE()
=OPEN("NORTH.XLS")
=SELECT("R3C2:R6C2")
=COPY()
=FILE.CLOSE()
=SELECT("R3C3:R6C3")
=PASTE()
=OPEN("SOUTH.XLS")
=SELECT("R3C2:R6C2")
=COPY()
=FILE.CLOSE()
=SELECT("R3C4")
=PASTE()
=OPEN("WEST.XLS")
=SELECT("R3C2:R6C2")
=COPY()
=FILE.CLOSE()
=SELECT("R3C5:R6C5")
=PASTE()
=RETURN()
```

LISTING 1: This simple macro consolidates data from four worksheets. You don't need to type in every line—simply use the macro recorder and follow the steps in the text—but be sure to check each line for errors.

▶ Creating the Macro

You're now ready to create the consolidation macro shown in **LISTING 1**. You could key in these macro instructions yourself, but using the macro recorder is quicker.

1. From the Macro menu choose *Record*. This brings up the Record Macro dialog box.

2. Name the macro **Consolidate_sales**. Since you don't need to assign it a shortcut key, delete the one *Excel* offers.

3. For each of the files for the individual regions (East, North, South, and West) follow these steps: Open the file. Select the range B3:B6, and invoke the Edit Copy command. Close the file. Paste the data into row 3 of the appropriate column (B, C, D, or E) of TOTSALES.XLS.

4. From the Macro menu choose *Stop Recorder*.

5. Use the Window menu or <**Ctrl**>-<**F6**> to bring up (activate) the macro sheet, and save it as UPDATE.XLM.

▶ Creating the Macro Button

Now it's time to assign the macro to a button that your assistant can easily activate from within the worksheet. First activate TOTSALES.XLS and decide where you would like the button to appear (we'll put it to the right, in the vicinity of column H). To create the button, follow these steps:

1. Click the macro button icon on the tool bar. It's the next-to-last button on the right, just to the left of the camera icon.

2. Move the mouse pointer to the upper-left corner of cell H3.

3. Click and drag the mouse down and to the right to size the button. A rectangular area approximately the size of two or three cells works best. After you release the mouse button, a button icon labeled 'Button 1' appears on screen in the area you just defined. A dialog box labeled 'Assign to Object' also appears, listing the macro you just defined in the Assign Macro list box.

4. Double-click the Consolidate_sales macro entry in the list box.

5. Key in a meaningful name, such as **Update**, for the button.

6. Click on any part of the worksheet outside the button and save the file. Your screen should now resemble **SCREEN 1**.

Next, move the mouse pointer over the Update button. When the pointer changes to a pointing hand, it's a sign that clicking on the button will run the macro. (If you want to change the shape or location of the button or make any changes to its label, you can select the button by holding down <**Ctrl**> while clicking the mouse button.)

Close all files except for the macro sheet. Compare your recorded macro with **LISTING 1**, and make corrections if necessary. Then open TOTSALES.XLS, clear the values in B3:F6, and click on the Update button. *Excel* fills in the regional sales figures.

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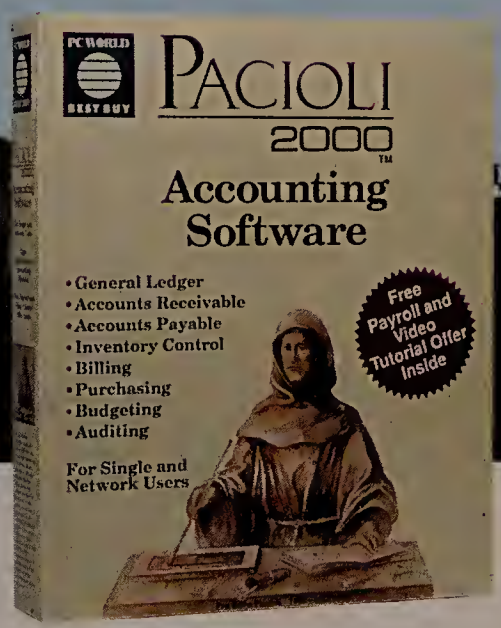

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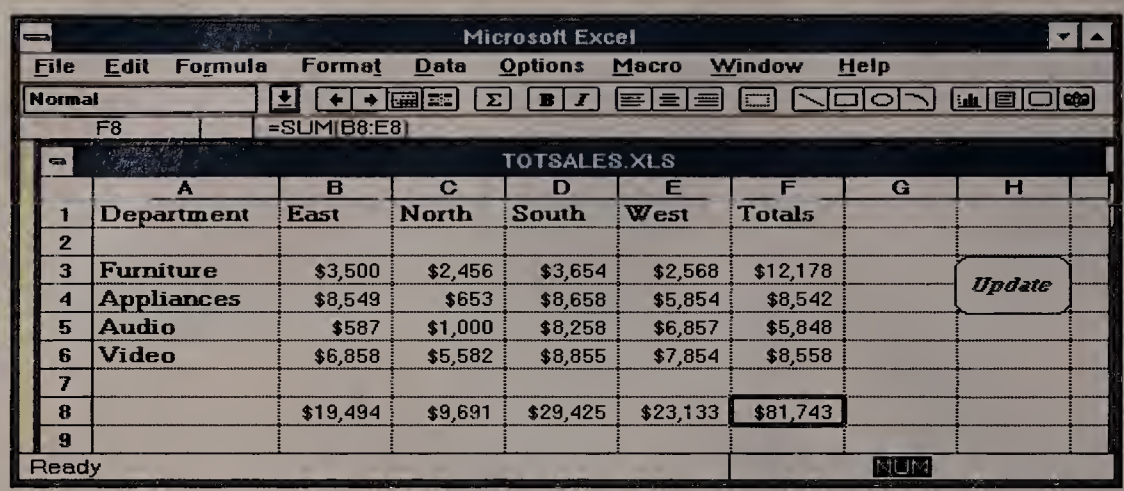


	A	B	C	D	E	F	G	H
1	Department	East	North	South	West	Totals		
2								
3	Furniture	$3,500	$2,456	$3,654	$2,568	$12,178		
4	Appliances	$8,549	$653	$8,658	$5,854	$8,542		
5	Audio	$587	$1,000	$8,258	$6,857	$5,848		
6	Video	$6,858	$5,582	$8,855	$7,854	$8,558		
7								
8		$19,494	$9,691	$29,425	$23,133	$81,743		
9								

SCREEN 1: Excel 3.0 enables you to create graphical objects like the Update button shown here and to allocate macros to them. This feature makes running macros a snap and delegating complex operations to your nontechnical assistants a realistic option.

As with any item in a worksheet, deleting rows or columns around a macro button will change the button's location. You can also move macro buttons with the Cut and Copy commands in the Edit menu.

▶ Making Life Simpler for Your Assistants

There's one more step. As things stand, your assistant has to open both TOTSALES.XLS *and* the macro sheet UPDATE.XLM before pressing the macro button marked 'Update'. That's no big strain. But since you'll be delegating more spreadsheet tasks to this person and therefore creating more macros, it's best to keep things as simple as possible.

You can reduce the start-up procedure to a single step with *Excel*'s auto-open feature. Your able assistants already know that the end product will be a revised *Excel* document named TOTSALES.XLS. When you use auto-open, they can simply open the TOTSALES.XLS file to get started.

This involves making a *second* macro that will open UPDATE.XLM when you open the document. First, open a new macro sheet, and enter the following formulas in cells A1 through A5:

Update_start
=open("update.xlm")
=hide()
=activate("totsales.xls")
=return()

Next, select cell A1, and choose *Define name* from the Formula menu. Choose *Command*, then select *OK*. It isn't necessary to assign a shortcut key, so simply save the macro sheet as OPEN1.XLM. Open the TOTSALES.XLS worksheet, and select *Formula Define name* to add the name **Auto_open.** Select the entire entry in the 'Refers To' text box, then activate OPEN1.XLM and select cell A1, and select *OK*. Delete the sales figures in columns B through E in the TOTSALES.XLS worksheet. Finally, close all files, saving any changes.

Test the auto-open macro by opening the TOTSALES.XLS file. The macro opens the UPDATE.XLM macro sheet, which you can now run by clicking on the Update macro button.

Now you have something that goes beyond a mere macro. It's really a rudimentary application that runs when you open the data file. And, as you assign more macros to buttons, you can add them to the auto-open macro OPEN1.XLM. As your application becomes more sophisticated, you might want to add a number of capabilities to this macro—such as a reminder that will tell your assistants to ensure that the supporting worksheets are all up-to-date before proceeding.

Combining macro buttons with the auto-open feature can empower your assistants and allow everyone to work smarter. And it doesn't take much effort or expertise to get started. ■

Contributing Editor Ralph Soucie is the author of Learn Microsoft Excel Now *(Microsoft Press, Redmond, Washington, 1990).*

POWER TIP NO. 183

Streamline Excel Macros With Subroutines

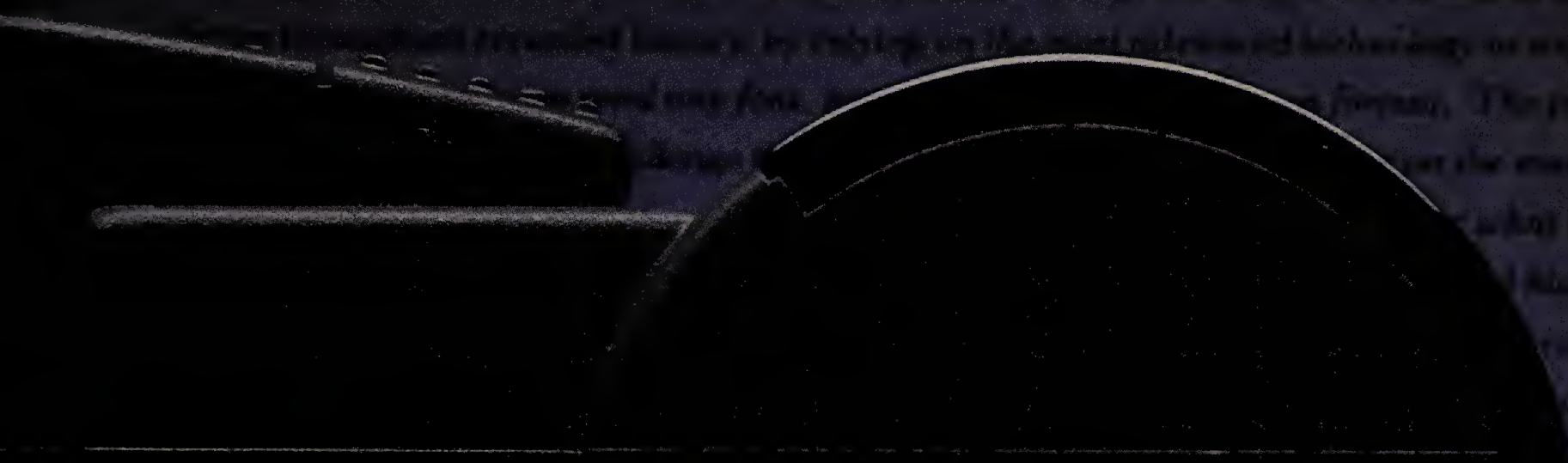
Often a macro must repeat the same series of commands over and over. It's easier and more efficient to make those commands a subroutine—a macro within a macro.

Here's a simple example. Suppose you want a macro to format several selected columns as percentages. First, use *File New Macro sheet*, and choose an out-of-the-way area—in this example we'll start at cell A100. To name the subroutine, enter **FormatPercent()** in cell A100, select *Formula Define name*, click on *Command*, and press <**Enter**>. Type **=select("c")** in cell A101 and **=format.number("0.00%")** in cell A102. End the subroutine by entering **=return()** in cell A103.

Now, wherever you want a macro to apply the percentage format to the current column in your worksheet, simply use the formula **=FormatPercent()** in that macro.

Ralph Soucie
Contributing Editor

The Ultimate Typist



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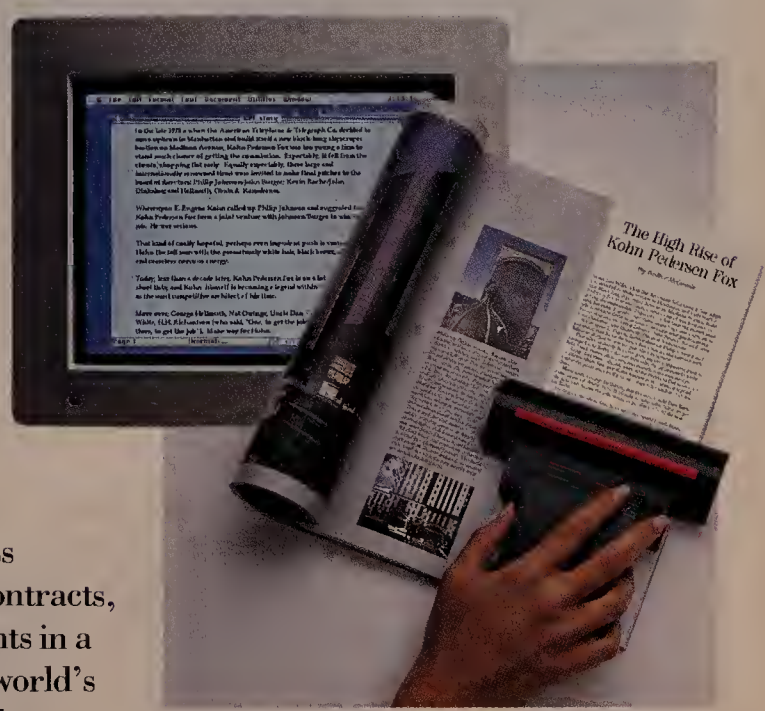

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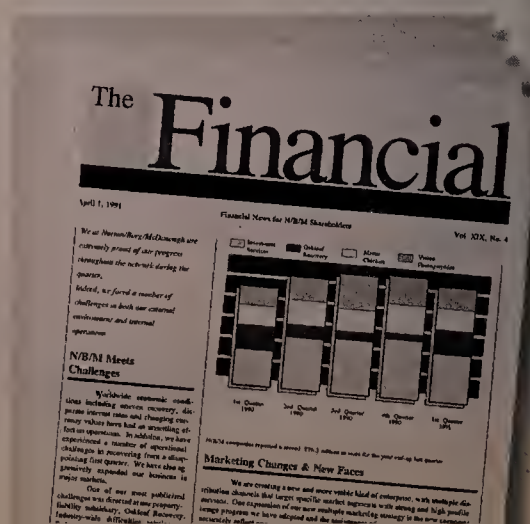
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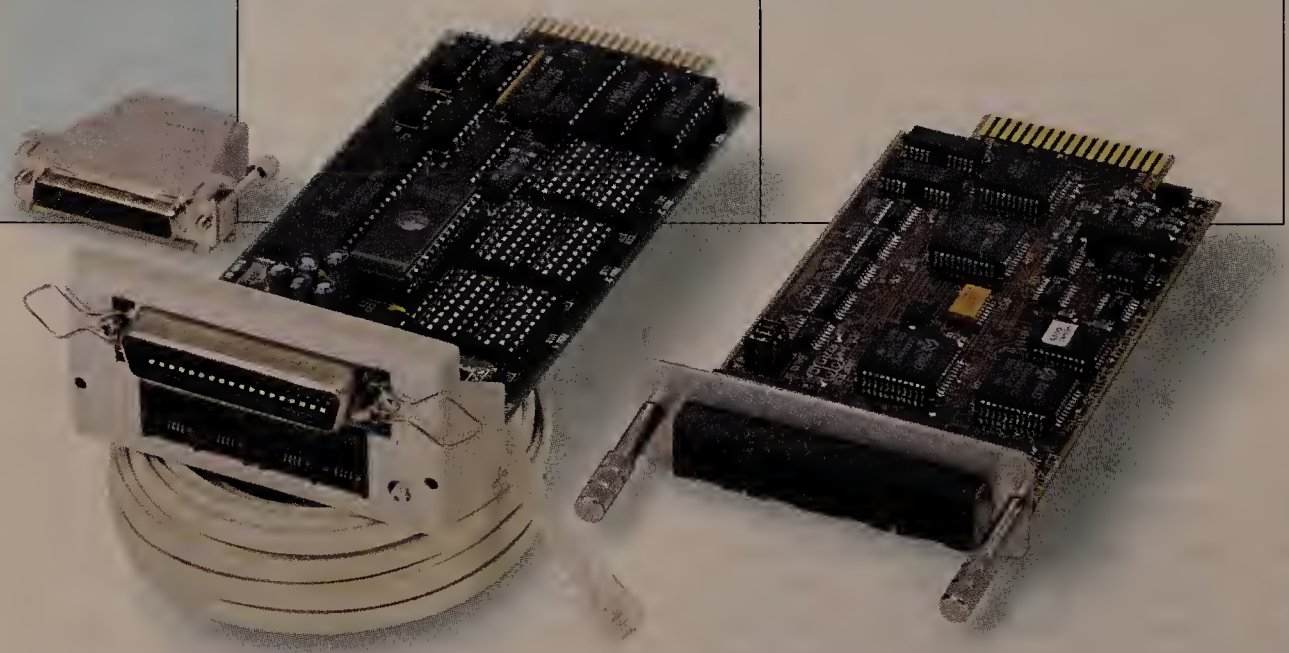

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Words Into Print

Word Processing

Tips for getting the most out of your word processor

This month: Master WordPerfect tabs, convert text from uppercase to lowercase in WordPerfect, and find files with Word 5.0's full-text search tools.

George Campbell

In the early days of PCs, you could line up text in columns just by pressing the <Space> bar a few times. But those days are gone. While your old daisy wheel printer spaced text evenly, today's printers use proportional spacing, so text aligned on screen may not line up on paper.

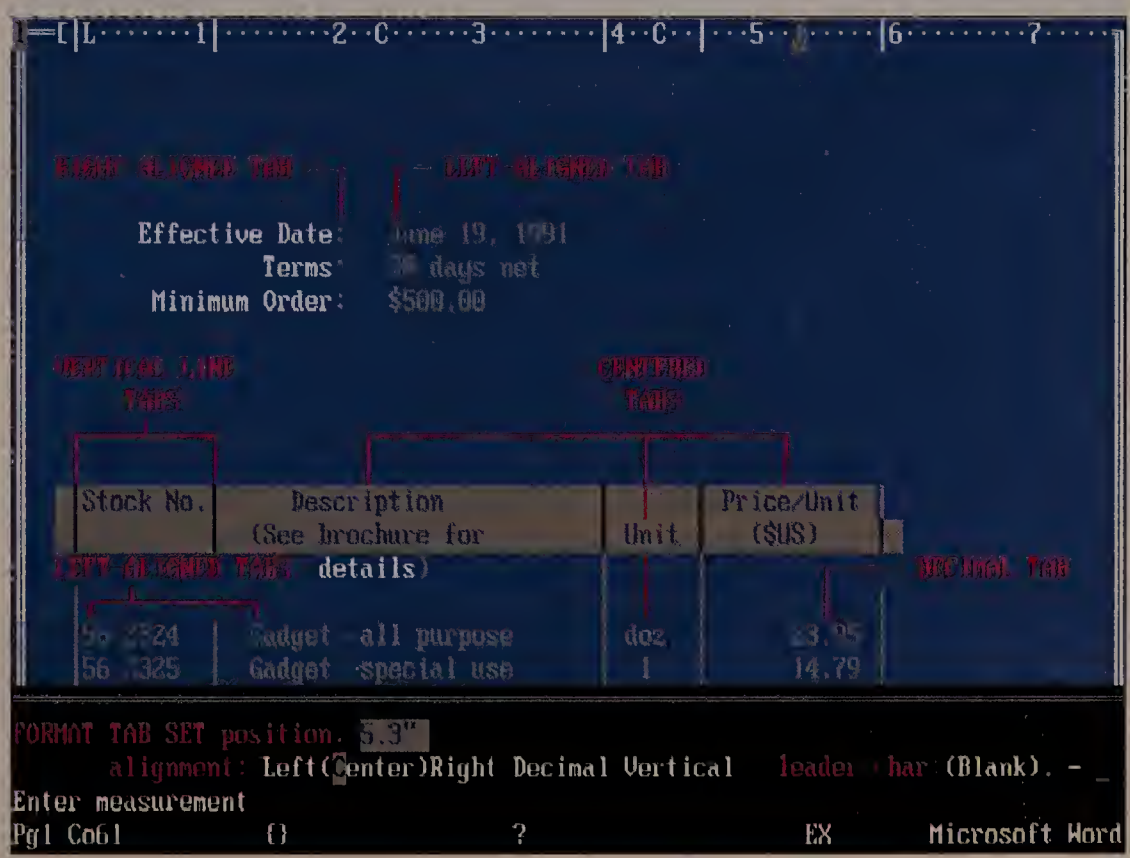
Whether you're creating a price list, as in **SCREEN 1**, or a short tabular list in a memo, your program's tab-setting feature will line the text up perfectly. Many word processors offer other options for aligning columns as well. Use your program's side-by-side–column feature for large blocks of text that take up a page or more. When you need lines and borders around data, use the table editor—if your program has one. But when you simply want to line up a list or set up a short table, tabs are fast and easy.

Most programs, such as *WordPerfect,* alter tab settings by inserting a tab ruler in the document. Tabs set this way apply to all text below the ruler and stay in effect up to the point where you insert a new ruler. *Word*'s tabs, however, apply only to paragraphs you select before you set the tabs.

A Tab for All Seasons

Most word processors offer several tab types. Here's a quick rundown:

- Left-aligned tabs are usually the default. Use them for text that starts at the tab position and stretches to the right. Left tabs are commonly used for text tables.
- Right-aligned tabs let you align the right side of text, as in **SCREEN 1.** Right-aligned text works well in one- or two-column text tables, but it usually looks out of place if the table has more columns. In a two-column table, set a right-aligned tab for the left column and a left-aligned tab for the right column, as shown in **SCREEN 1.** Right-aligned tabs are also ideal in headers or footers, especially on right-hand pages in facing-page layouts.
- Centered tabs work best for titles or headings above lists. The text stretches an equal distance to the left and right of the tab position.
- Decimal tabs are perfect for lining up prices or other decimal numbers. Characters stretch to the left, as with a right-aligned tab, until you press the period key. Characters after the period will stretch to the right of the tab position. You can also choose a different alignment character in most programs. Some word processors, like *WordStar,* that lack right-aligned tabs let you use decimal tabs instead. As long as you don't type a period, the effect is the same as that of a right-aligned tab.
- Most packages let you adorn tabs with leader dots that stretch from the



SCREEN 1: Setting a few tabs makes a complex document like this price list a breeze to read. Word's vertical tab feature, which places a line to the left of each tab, makes it easy to create vertical rules. You use decimal tabs to line up numbers.

previous tab's text to the current tab's text. Use this feature to print a line of eye-leading dots when tabs are separated by more than a few inches, as in a table of contents.

In WordPerfect Alignment

Here's how you set tabs in *WordPerfect 5.x*. The steps are similar in other word processors.

First, place the cursor at the start of the text (or where the text *will* start) and press **<Shift>-<F8>lt**. You'll see the tab-setting menu at the bottom of the screen. To clear old settings, press **<Home><Home><Cursor Left><Ctrl>-<End>**.

Place the cursor on the ruler where you want a tab. By default, tab settings start at the left margin. Press **l** for a left-aligned tab, **c** for a centered tab, **r** to create a right-aligned tab, or **d** to set a decimal tab. To create leader dots for a tab, move the cursor to that tab, then press the period key. Leader dots automatically adjust for centered, right, and decimal tabs as you enter text.

The ruler is normally divided into tenths of an inch. To specify a more precise location, from any point within the tab menu type in a measurement for the tab, then press **<Enter>**. *WordPerfect* will insert a left-aligned tab. To alter the tab's type, highlight the tab and press one of the other letters.

After setting the tabs, press **<F7>** twice to return to your document. The settings will apply up to the point in the document where you change them—if you move the cursor back, above the new ruler, the old tabs will apply. To return to normal tab settings, press **<Shift>-<F8>lt<Ctrl>-<End>0,.5<Enter><F7><F7>**. To alter the default half-inch placement, simply change the '.5' spacing in the command above.

To alter the settings, place the cursor on the line where you want the tab changes to start. Press **<Shift>-<F8>lt**, then move the cursor to the tab you want to change. To delete a tab, press **<Delete>**. To alter a tab's type, press a new tab letter. To add or remove leader dots, press the period key. In version 5.1, you can even move tabs—just hold down **<Ctrl>** while you move the marker with the cursor keys.

You can change the alignment character for decimal tabs by pressing **<Shift>-<F8>od**. Type in a new alignment character, then press **<F7>**. If you want to see a tab ruler at the bottom of the screen as you work, press **<Ctrl>-<F3>w22<Enter>**. (In version 5.0, replace 'w22' with **w23**.)

Finally, you can create a new default tab setup to use whenever you run *WordPerfect*. Start the program, and press **<Shift>-<F1>ic**. Press **<Shift>-<F8>lt**, set your tabs, and press **<F7>** four times. From then on, *WordPerfect* will start up with the new settings.

George Campbell is a contributing editor for PC World.

WORDPERFECT SHORTCUT

Case Shifting

WordPerfect 5.x has a little-known command that switches a block of text from uppercase to lowercase, or vice versa. First, mark the text as a block using **<Alt>-<F4>**. Then press **<Shift>-<F3>**, followed by **u** for uppercase or **l** for lowercase.

When converting to lowercase, *WordPerfect* capitalizes the first letter of a sentence if a period appears before it. The pronoun *I* also stays capitalized, as do any single-letter abbreviations followed by periods.

WORD SHORTCUT

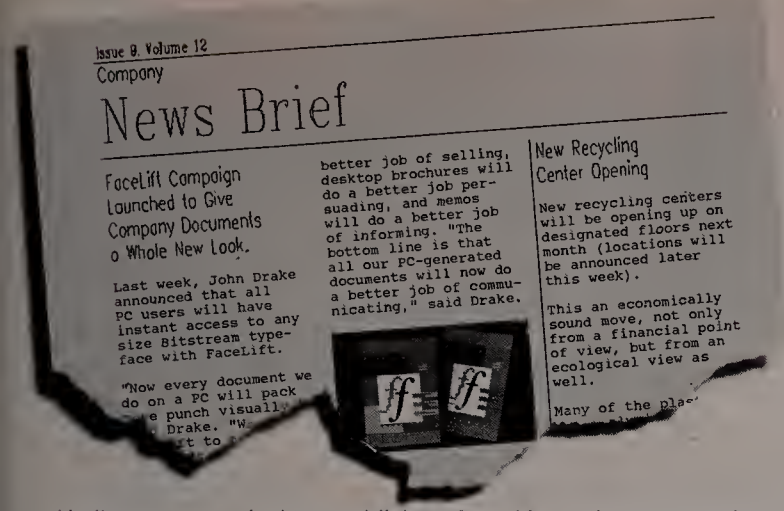
Find That File

Word 5.0's Library Document-retrieval command will search through an entire directory of documents for text you specify, then let you load the document you want. This macro automates the process. Follow the steps below on a blank *Word* screen:

1. Press **<Shift>-<F3>** to begin recording.
2. Press **<Esc>ldq**, then press **<Cursor Down>** five times.
3. Press **<Shift>-<F3>** to end recording.
4. Type **FindText.mac^**, press an unused **<Ctrl>-***key* combination such as **<Ctrl>-F**, then press **<Enter>e**.
5. Press **<Esc>tgs** to save the macro.

To use the macro, press **<Ctrl>-F** (or whatever combination you chose). Type the text you want to find, and press **<Enter>**. *Word* will search all documents in the current directory, then show you a list of files. To load a file, highlight it, then press **l<Enter>**.

Before


Issue 9, Volume 12
Company
News Brief

FaceLift Campaign Launched to Give Company Documents a Whole New Look.

Last week, John Drake announced that all PC users will have instant access to any size Bitstream typeface with FaceLift.

"Now every document we do on a PC will pack ... punch visuall... Drake. "W... to ...

better job of selling, desktop brochures will do a better job persuading, and memos will do a better job of informing. "The bottom line is that all our PC-generated documents will now do a better job of communicating," said Drake.

New Recycling Center Opening

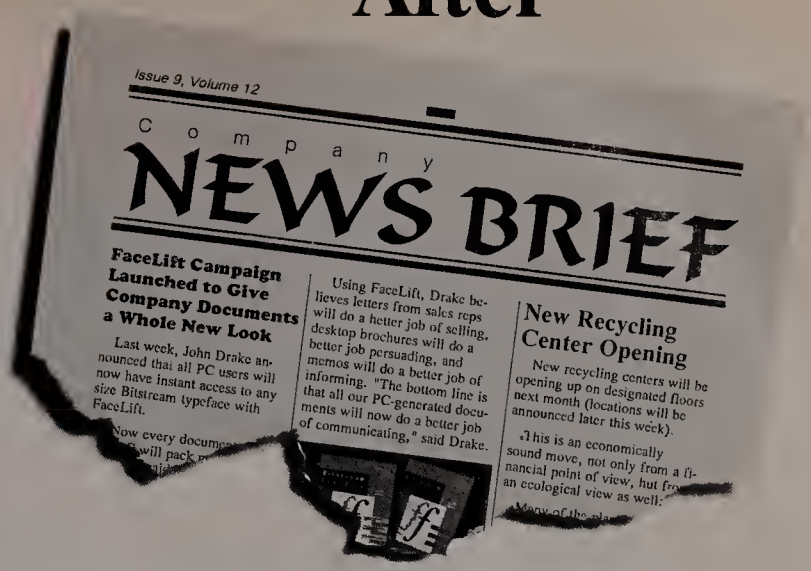
New recycling centers will be opening up on designated floors next month (locations will be announced later this week).

This an economically sound move, not only from a financial point of view, but from an ecological view as well.

Many of the plas...

Until now, many desktop publishers found it too time-consuming to use the right typefaces and point sizes. Unfortunately, the end result was often too plain-looking for potential readers.

After


Issue 9, Volume 12
Company
NEWS BRIEF

FaceLift Campaign Launched to Give Company Documents a Whole New Look

Last week, John Drake announced that all PC users will now have instant access to any size Bitstream typeface with FaceLift.

Now every docum... will pack ...

Using FaceLift, Drake believes letters from sales reps will do a better job of selling, desktop brochures will do a better job persuading, and memos will do a better job of informing. "The bottom line is that all our PC-generated documents will now do a better job of communicating," said Drake.

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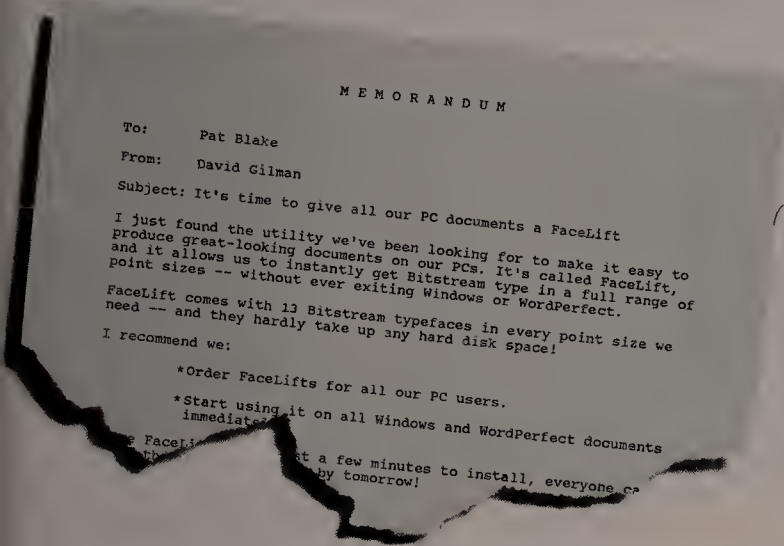
"This is an economically sound move, not only from a financial point of view, but fr... an ecological view as well."

Many of the ...

FaceLift will instantly give you faces and point sizes to create great-looking documents that make you look like a desktop publishing pro. FaceLift comes with 13 Bitstream typefaces.


MEMORANDUM

To: Pat Blake

From: David Gilman

Subject: It's time to give all our PC documents a FaceLift

I just found the utility we've been looking for to make it easy to produce great-looking documents on our PCs. It's called FaceLift, and it allows us to instantly get Bitstream type in a full range of point sizes -- without ever exiting Windows or WordPerfect.

FaceLift comes with 13 Bitstream typefaces in every point size we need -- and they hardly take up any hard disk space!

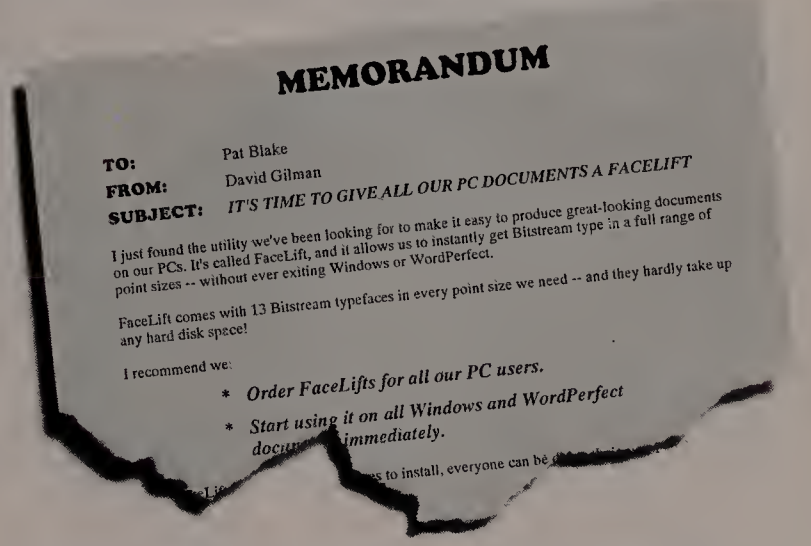
I recommend we:

*Order FaceLifts for all our PC users.

*Start using it on all Windows and WordPerfect documents immediate...

FaceLi... ...t a few minutes to install, everyone ca... by tomorrow!

This memo, using one face in one size, looks fairly decent. But why settle for "fairly decent" when FaceLift will instantly make your Windows or WordPerfect documents look "absolutely great!"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* *Order FaceLifts for all our PC users.*
* *Start using it on all Windows and WordPerfect docu... immediately.*

...s to install, everyone can be ...

You'll install FaceLift in about 10 minutes. Then in seconds, get the typefaces and point sizes you need to make a perfect impression.

Bitstream introduces the Instant FaceLift for your Windows or WordPerfect documents.

Now make all your Windows™ or WordPerfect® documents great-looking in seconds with FaceLift.™

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Swiss 721 Italic
Swiss 721 Bold
Swiss 721 Bold Italic

Dutch™ 801 Roman
Dutch 801 Italic
Dutch 801 Bold
Dutch 801 Bold Italic

Monospace 821

Bitstream Cooper Black

Formal Script 421

Park Avenue™

Brush Script

FaceLift and 13 Bitstream scalable typefaces (with four headlines faces) cost only $99 (suggested retail). For the best deal, add the Companion Value Pack with 24 more Bitstream typefaces for only $199 (suggested retail).

For more information, see your local dealer, or call:

1-800-522-FONT, ext.1601

FaceLift for Windows

FaceLift for WordPerfect

Bitstream

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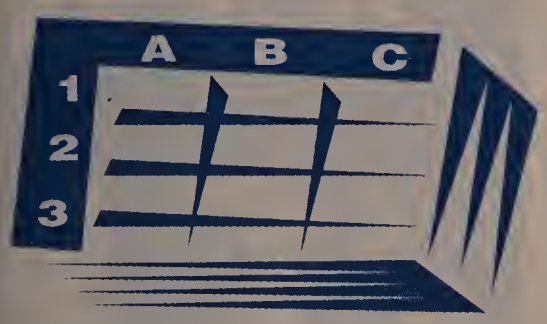
Spreadsheets (A..Z)



Spreadsheets

Practical tips for building better worksheets

This month: the battle of the bloat—tips for handling large worksheets

Richard Scoville

As spreadsheets grow, they become awkward to view on screen, print, or simply navigate. April's *Spreadsheets (A..Z)* column demonstrated the fine points of printing big worksheets; this month, we provide some hints for organizing and viewing them on the screen. You can apply this month's tips to *1-2-3* version 2.*x* and 3.*x* and to all releases of *Quattro*.

The Diamondback

The first step in avoiding a sprawling spreadsheet is to divide it into discrete work areas and then arrange those zones into a diamondback pattern like the one shown in **FIGURE 1**. The diamondback pattern helps ensure that the areas of the worksheet do not interfere with one another when you insert or delete rows or columns and when you adjust the widths of the columns.

Let's say you're using a spreadsheet to manage your small-business accounts receivable. Your work areas might include lists of clients and receivable items, and a report area from which to print invoices. In addition, you'll want a separate area for macros. In *1-2-3* release 2.*x* or any version of *Quattro*, you might use the layout pattern shown in **FIGURE 1**, allocating cells A1 to, say, H9 for macros, I10 to U26 for receivables, and so forth. In *1-2-3* release 3.*x*, you could insert a new worksheet for each work area, using */Worksheet Insert Sheet After*. The diamondback pattern, however, is the most convenient alternative to complex multifile designs, particularly if your work requires that you exchange files between different program versions.

Using */Range Name Create* (in Quattro, */Edit Names Create*), identify the upper left corner cell of each work area with a descriptive "landmark" range name. Begin all landmark names with @—as in @CLIENTS, @MACROS, @RECEIVABLES, and so on—and

SPREADSHEET TOOLBOX

SQZing Your Files Down to Size

When it comes time to save those overweight *1-2-3* release 2.*x* worksheets on your already crowded hard disk, you'll find Symantec's *SQZ* is just the reducing program you need. Once enabled, this $99 add-in automatically and unobtrusively compresses your worksheets as you save them, then decompresses them when you retrieve. When I tried *SQZ* with a few worksheets lying around my hard disk, the results were impressive. For instance, it reduced an 80K worksheet to 37K. Amazingly, saving a worksheet with *SQZ* doesn't seem to take much longer than a regular save.

Also provided with *SQZ* are some useful utilities: an add-in that will automatically save your current worksheet at specified time intervals, an add-in that lets you back up and restore files in the same format as DOS's regular backup program, and a command-line utility that compresses and decompresses worksheets in batch mode.

Yet another add-in maintains a transcript of every key you press during a worksheet session. The result is error-correction capability that far exceeds *1-2-3* release 2.2's Undo: By retrieving the worksheet as it was at the start of the session and replaying keystrokes, you can restore the worksheet to the way it was just before the big mistake.

If you work with big worksheets, and if your hard disk space is limited, *SQZ* is an invaluable tool.

SQZ $99; Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014; 800/441-7234
Reader service no. 616

Mapping Out Your Worksheet

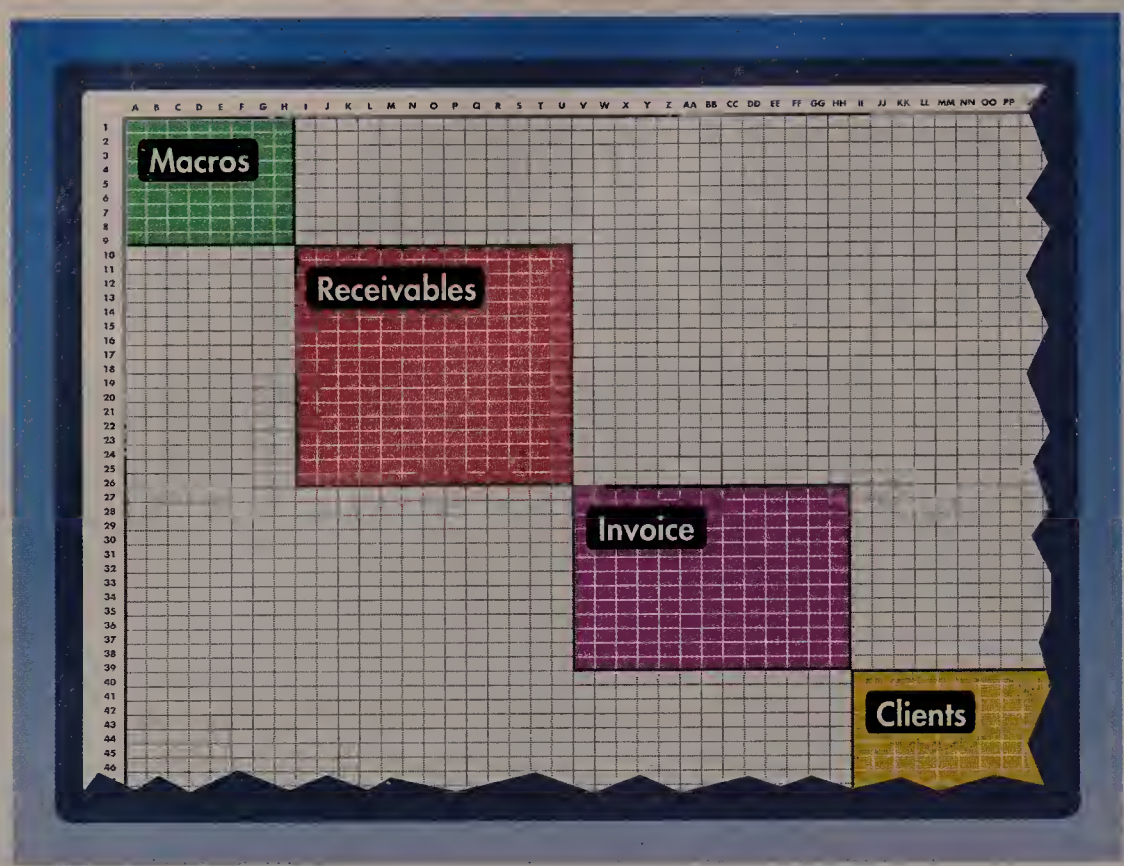


FIGURE 1: By mapping the zones of a big worksheet into a diamondback pattern, you ensure against accidentally removing information as you delete columns and rows in another section.

they will conveniently appear, in alphabetical order, at the top of the range name menu.

With this arrangement, you'll find that navigating even the largest worksheet is a snap: Press <**F5**>, then <**F3**>, and *1-2-3* will present you with a list of landmark range names. Select a landmark range name from the list, and press <**Enter**>.

Working With Windows

Comparing and editing widely separated areas of a worksheet is awkward if you can't view them together on the screen. Fortunately, there's a neat solution: split the screen into two windows. For a horizontal split, position the cell pointer where you want the screen to divide. In *1-2-3* you then select */Worksheet Windows Horizontal, /Worksheet Windows Unsync* (in *Quattro*, select */Window Option Horizontal*, then */Window Option Unsync*). Press <**F6**> to switch windows, and use <**F5**> and <**F3**> to position each window on a different work area within the spreadsheet.

Lock Those Titles

In any spreadsheet larger than the screen, it is easy to get lost looking for a particular data value: As you hunt around, the identifying row and column labels slip out of view. In order to keep the labels visible at all times, you can lock the titles.

First, position the screen so that the required row and column labels are at the left and top of the screen, respectively. Then position the cell pointer on the first cell in the data area. In *1-2-3*, select */Worksheet Titles Both*; in *Quattro, /Window Options Locked titles Both*. Now, the label rows and columns won't slip out of sight.

With titles locked, when you press <**Home**>, the pointer returns not to cell A1, but to the top left corner of the visible range of the worksheet's data. You can't move with the cursor directly to cells in the titles zone. To edit a titles cell without turning locked titles off, press <**F5**>, use the cursor keys to move to the desired cell, and press <**Enter**>. To restore the screen, press <**End**> <**Home**><**Home**>.

EXCEL SHORTCUT

Smart Consolidations

Ralph Soucie

With *Excel 3.0* you can quickly consolidate totals from widely separate sections of a large worksheet or from a group of worksheets. First, open the relevant worksheet(s) and select the range where you want to consolidate the totals. Choose *Data Consolidate*, which brings up the Consolidate dialog box.

Then, select the first range containing an amount to be aggregated, and click on the Add button in the dialog box. Repeat this process for all the relevant sections or files. Then click *OK* or press <**Enter**> to consolidate the totals.

You can streamline the selection process when you're consolidating data from multiple files. Use similar file names for the relevant files (let's say they all begin with SALES) and the same cell reference for data to consolidate, B4:B12 for example. Enter **SALES*.XLS!$B$4:$B$12** in the Reference text box, and *Excel* will include totals from all worksheets—even unopened ones—whose names begin with SALES.

As your spreadsheet skills and business needs grow, your worksheets inevitably become larger and more complex. By cultivating the practices outlined here, you can ensure that they remain easy to handle.

Richard Scoville and Ralph Soucie are contributing editors for PC World.

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In the 90's it's cool to be cheap,

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Let us pause in memory of those archetypes which, in the previous decade, were deemed the essence of cool.

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Down comes the curtain on the epoch and, presto, a very different cast of symbols takes the stage. Not Wall Street but Main Street. Not the condo in Aspen but the tent-site in the Tetons. Not the Swiss bank but the piggy bank.

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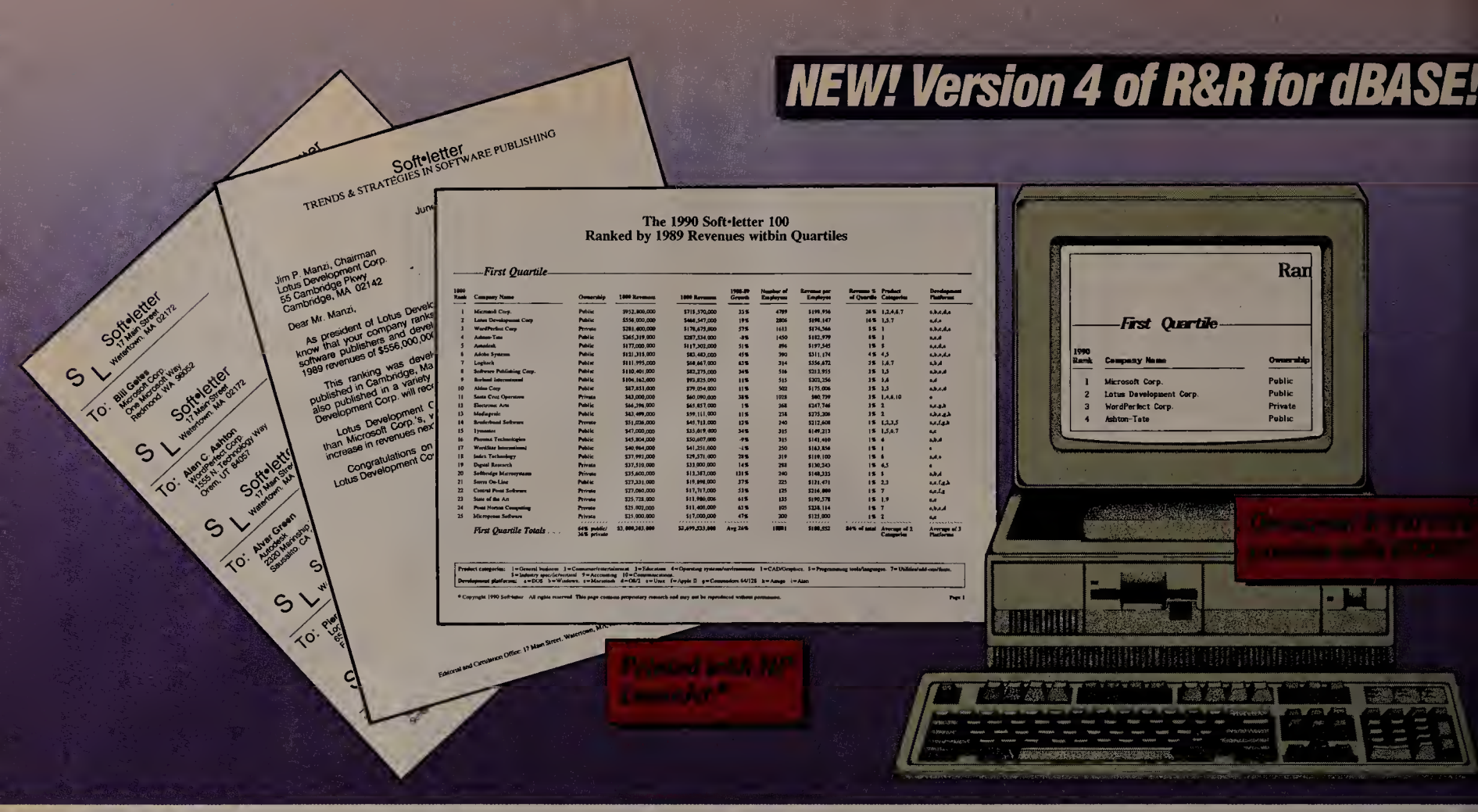

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That, too, is the Panasonic way. And the reason why our strongest impression is value. For further information on the KX-P1124*i*, and the name of the dealer nearest you, call **1-800-742-8086.**

* Based on US dollar market share of competitive models for the 12 months ending December, 1990, as reported by InfoCorp (1/91)

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Data Basics

Data Management

Tips and techniques for managing your data

This month: Creating a to-do list

Steve Cummings

A to-do list does just what the name implies: It gives you a place to list and sort—by priority—tasks that you must do. A number of programs offer this feature, from simple pop-up "ticklers," to complex personal information managers that let you add comments and dates and view your tasks in various ways. But none of those programs offer the flexibility you'll get from creating a customized to-do list in your own data management program, especially if you want to integrate your tasks with other types of data.

You probably already have data base files listing your customers, contacts, co-workers, and so on. If you keep your to-do list in the same program, you'll be able to integrate that information into your task list without retyping or manually importing it. If you work in an R&D department, for instance, you could do a relational lookup—which searches through one file for a match to data in another—on the personnel file to find technicians with the expertise needed for a task. Almost every data manager, even simple ones, can handle lookups.

A few provisos: A homegrown to-do list takes longer to set up and test than off-the-shelf software. And unless you're a programmer with time to kill, your homegrown system will lack such niceties as an auto-dialer and a pop-up calendar—but you can fill those gaps with a TSR, *SideKick*, for instance.

What to Do

Before designing your to-do list's data structure, take some time to think out exactly what kind of information you'll need to include. Here are the basics:

- A task description field. Make this no longer than 60 characters; any more will crowd the screen when displayed in a table view.
- Three date fields: the date you first record the task, the completion deadline, and the actual completion date. Depending on the need for precision, you may want time fields as well.
- A one-character priority field. When pressure rises and time is short, you'll need to sort your list in order of importance. Use a simple 1 through 9 numbering scheme, with top-priority items labeled 1.
- A short classification field. Separating projects into categories, such as personal tasks, meetings, and correspondence, lets you examine similar kinds of tasks together. If your software

dBASE SHORTCUT

From a Table to a Form

Lincoln Spector

A Browse screen table view shows you many records at once, while an Edit screen form gives you a clearer view of one record. *dBASE III Plus* offers no way to toggle easily between these views, but you can create such a toggle by programming. Here's how to do it with the least amount of code:

```
x = .F.
DO WHILE .NOT. x
    BROWSE
    EDIT
    @ 21,37 SAY "Exit? " GET x
    READ
ENDDO
RETURN
```

This example assumes that your data file is already open. The program starts a loop that brings up the Browse screen (*dBASE*'s table view). Here, you can scroll through your data and even edit it. When you exit Browse by pressing <**Esc**> or <**Ctrl**>-**W**, the Edit screen appears, showing the record that was highlighted when you exited Browse.

When you exit the Edit screen with <**Esc**>, you'll be asked if you want to exit the program. If you answer **y** or **t**, the loop finishes. If you answer **n** or **f**, it starts over, bringing you back to the Browse screen.

A table view of a to-do list can show vital information for several tasks. By sorting on priority ('P'), 'Deadline,' and classification ('C'), you can see which tasks must get done first.

supports a multiple-choice field type that you fill in by selecting an option rather than by typing, use it here.

- A comments field. Leave yourself plenty of room for writing notes. If your program supports variable-length memo fields, use one. Otherwise, allow for about 300 characters.
- A relational key field. Relating tasks to another data file requires that the two files have at least one field in common. In the R&D example, both the to-do and personnel files need an Expertise field so your program can match people to jobs.

Personalizing Your List

Next, you can build upon this basic structure to customize the to-do list for your job's particular needs. If you organize small meetings, for instance, you may want five or six "people" fields to list co-workers. If your business takes you out of the office, you'll want a place to note hotel and room number, job site addresses, and critical phone numbers.

Because you'll want to display several records at the same time, design a table view that puts each record on its own line (see the screen). Since you can't fit all your fields into 80 columns (the width of your screen), put the most important fields—Deadline, Priority, Classification, and Description—on the left, where they're immediately visible. To view all of a task's fields simultaneously, set up your software so you can toggle to a one-record, full-screen form view.

Putting a to-do list together yourself requires more work than buying a shrink-wrapped program, but you'll realize a substantial payoff: a system that's customized for you and tightly integrated with the rest of your data.

Steve Cummings is a contributing editor for PC World *and the author of* Understanding Quicken *(Sybex, Alameda, California, 1990). Celeste Robinson is the author of* The Best Book of Paradox *(Howard W. Sams and Co., Carmel, Indiana, 1990). Lincoln Spector is a* PC World *assistant editor.*

PARADOX SHORTCUT

Making a Form Your Own

Celeste Robinson

When you view data in *Paradox*, <F7> acts as a hot key for going between the table and form views. By default, the form displayed with the hot key is a simple vertical listing of your table's fields. But *Paradox* lets you redesign this form to make it easier to read; for instance, you can place City, State, and ZIP fields on a single line.

To change the form display, select *Forms Change* from the main menu. Enter the name of your table when prompted, and press <Enter> to select the highlighted 'F' from the list of forms that can be changed. (Other forms are listed by number; if the table has no other forms, only the 'F' will be displayed.) Enter a description for the form, or press <Enter> to keep the default, Standard Form.

That boring, standard form now appears. Pressing <F10> brings up a menu of options for changing the look and, for that matter, the functionality of the form. For instance, you can use the *Area Move* command to move a field to another part of the screen, or the *Border Place* command to draw a box. Explore the menus to see what else is available. Once you're satisfied, press <F2> to save your work and exit. The next time you press <F7> from a table view, the current record will pop up in your new, improved form.

How To Teach Your PC New Tricks.

Add The Complete Communicator™ to give your PC FAX, modem and voice messaging capabilities.

The Complete Communicator makes it easier than ever to keep in touch with business associates.

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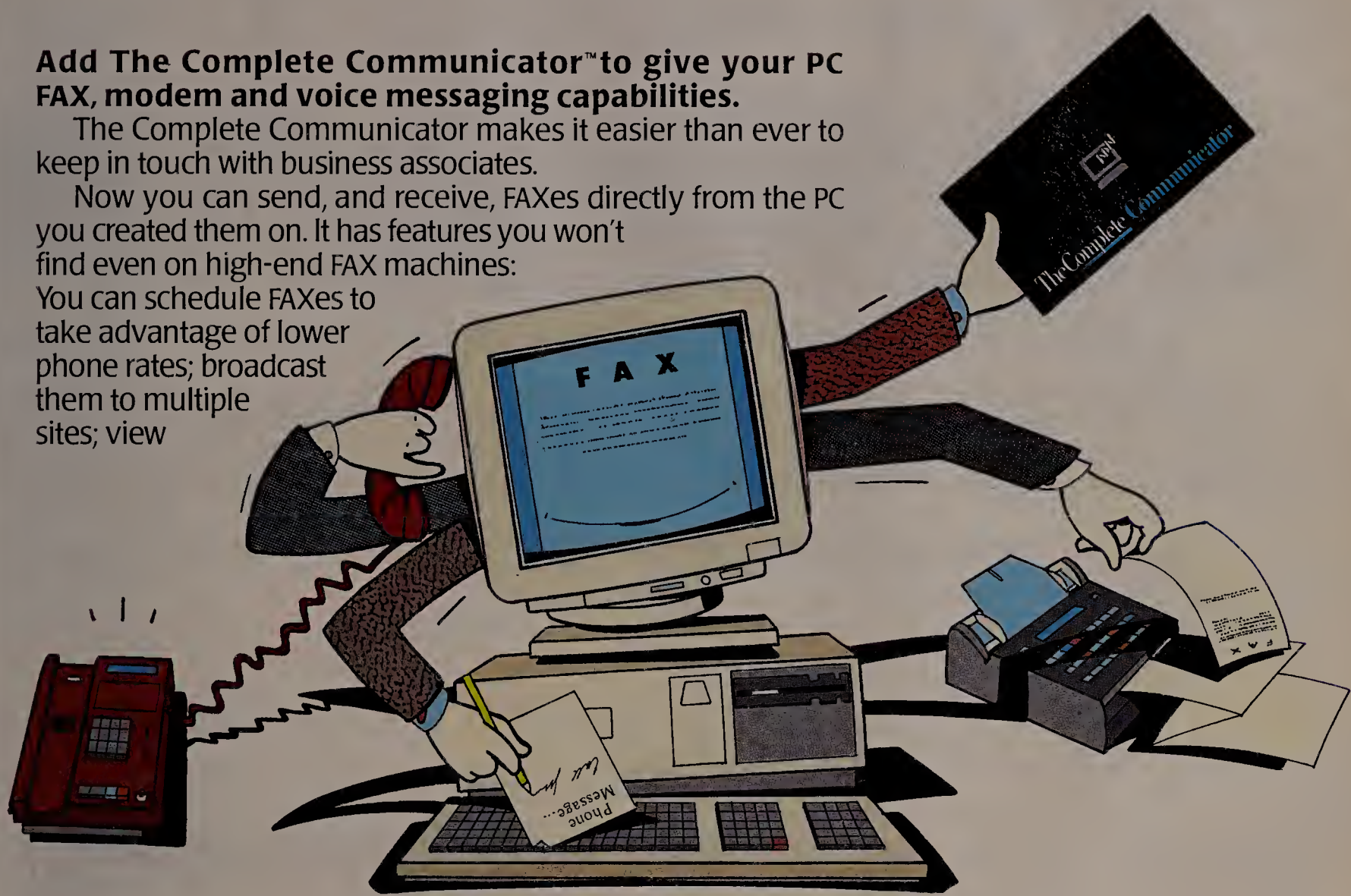

incoming FAXes on screen; print them out on plain paper; even forward incoming messages to a nearby FAX machine when you're on the road.

The Complete Communicator makes it easy to present a professional image to customers. It plays your personalized greetings on up to 999 password protected mailboxes; lets you retrieve messages remotely; and can automatically transfer calls and forward messages.

When you want to share data or access on-line databases and services, the built-in Hayes compatible modem does it quickly and easily using all the leading communications packages.

There's even a port to add The Complete Page Scanner,™ the easy way to add and store images.

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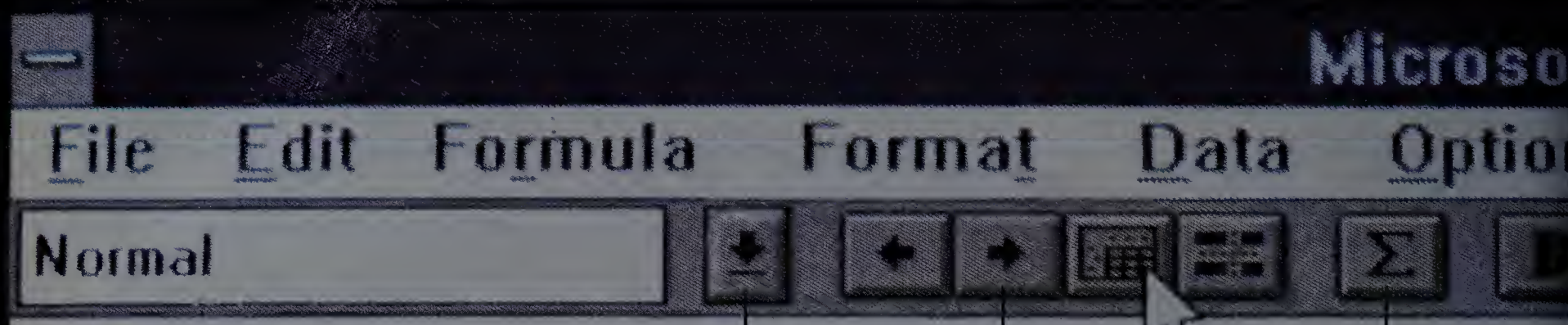

One step outlining. Outline worksheets to see only the detail you need.

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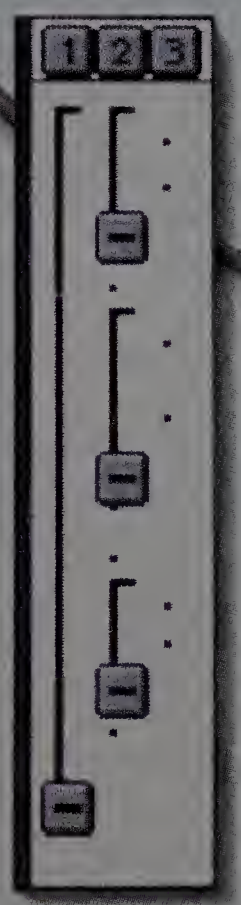

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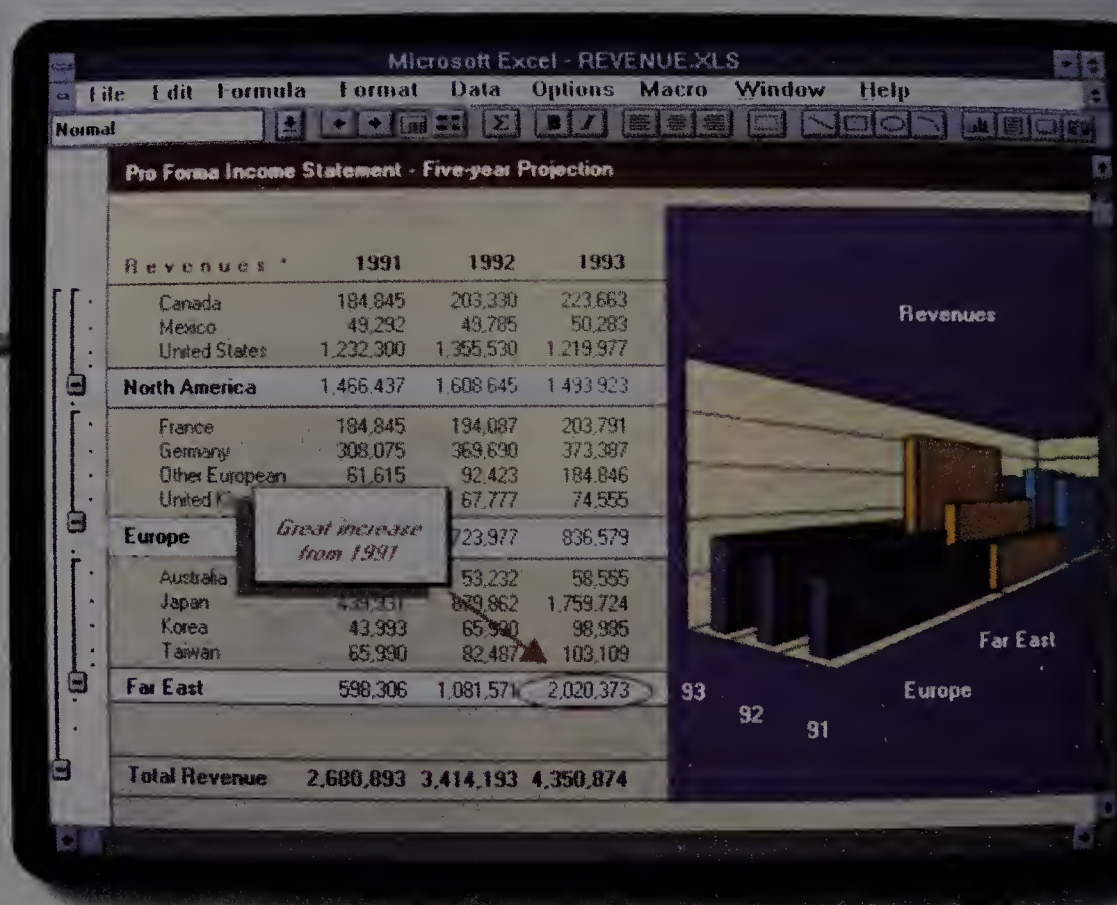

Select a range of cells and transform them into a chart on a worksheet. With one simple click. Or why not create a 3-D chart. Then rotate it 360°. How's that for a view? With new Microsoft Excel, you can choose from 68 different chart types, 24 of which are 3-D. Or even create your own. And because this is a graphical program, it's easy to combine text, data and graphics on a single page. Of course, it's WYSIWYG too. Which means you can actually see what you're working on.

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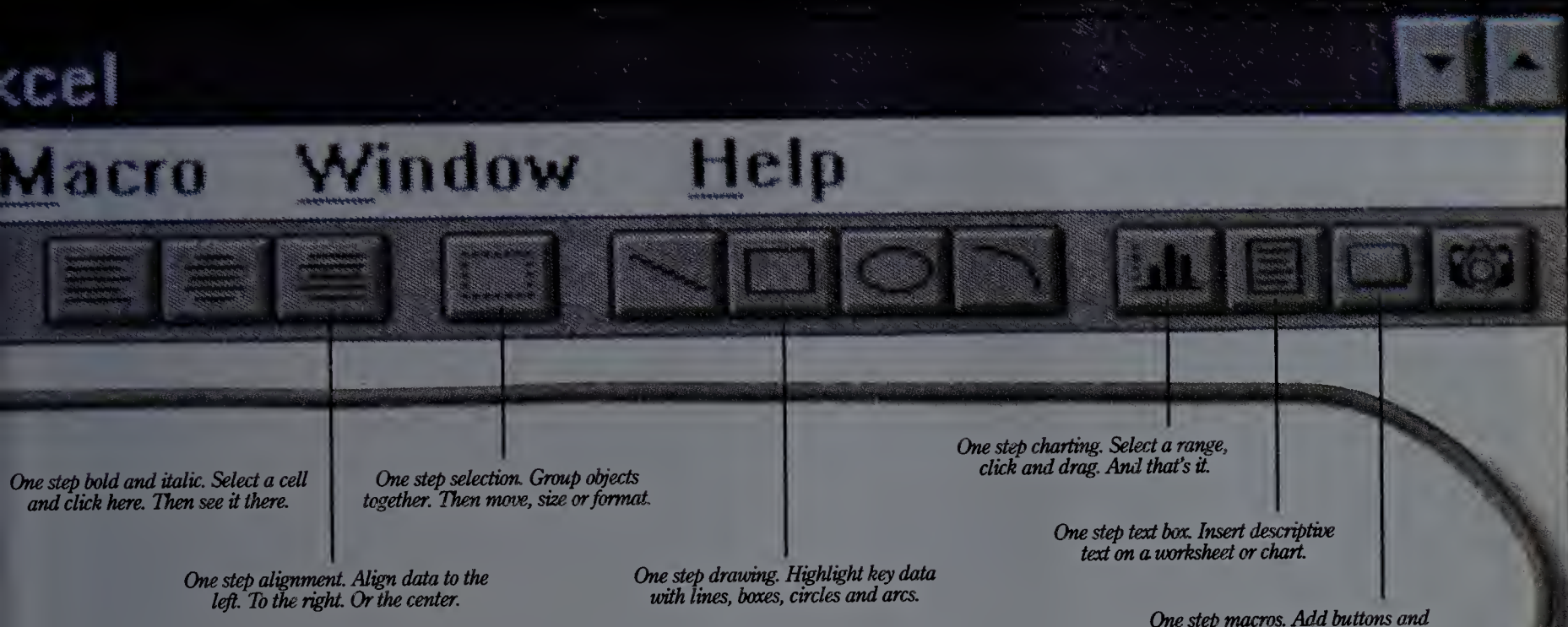

One step bold and italic. Select a cell and click here. Then see it there.

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Out of all the steps it took us to create the new Microsoft® Excel for Windows™, there were two in particular that had the most impact. The first was to listen to our users and to listen carefully. The second was to take that knowledge and implement it intelligently.

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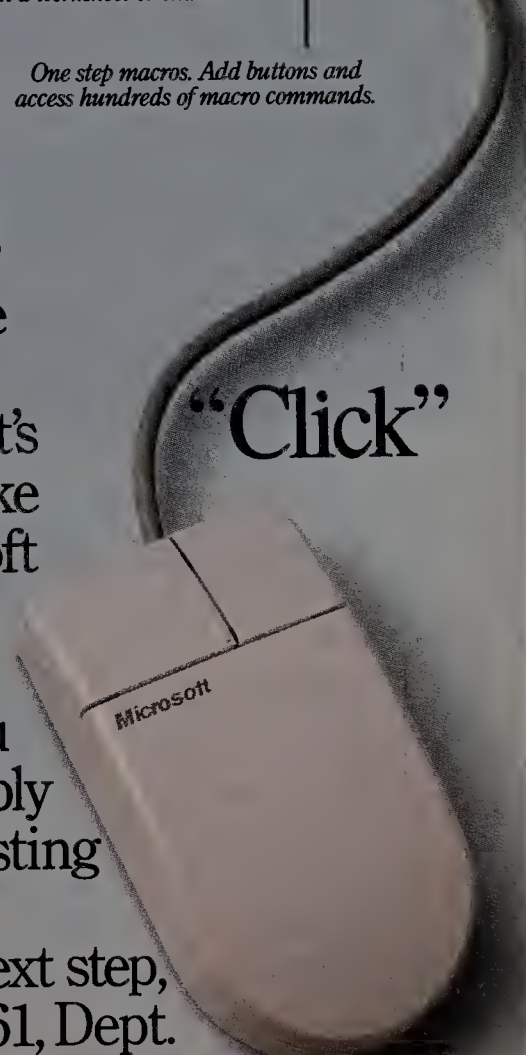
A recent example of this is the Toolbar™. This addition lets you do everything from formatting, to formulas, to outlining with one click of a button.

Best of all, it's really easy to make the move. Microsoft Excel comes with online help for 1-2-3® users. So you can learn by simply applying your existing knowledge.

Take the next step, call (800) 541-1261, Dept. P64, for the name of a dealer near you.



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DOS

tap tap tap
tap tap tap
tap tap tap
tap tap tap
tap tap tap
tap tap tap

Direct Access®

tap

Finally, a menu program that does away with the old song and dance.

Still using a chorus-line of commands to get into the programs on your hard disk? You need Direct Access.

All you do is load it and forget it. Direct Access lines up every program on a menu and lets you create custom sub-menus for related programs and other applications.

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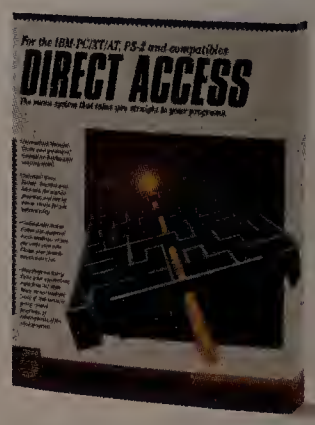
The choice is easy. Keep tapping away with DOS commands. Or step right into your programs with Direct Access.

Call now for complete details, volume discounts and your nearest Direct Access dealer. For a limited time, get Pyro!™, The Entertaining Screen Saver for the PC, free! Just write "Pyro" on the Direct Access registration card before you return it.



PC Magazine's Editor's Choice

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Circle 81 on reader service card

The Art of Persuasion

Publishing & Graphics

Expert advice for creating high-impact documents and presentations

This month: Add a splash of color to documents, and create a build series with Harvard data charts.

Richard Jantz

It's no secret that the easiest way to grab an audience's attention is by using color—and that the cost of printing full-color documents can quickly leave you in the red. But there's an easy cure to the color-printing blues. One of the most effective and economical ways to "colorize" a newsletter, brochure, or manual is to use *spot color*.

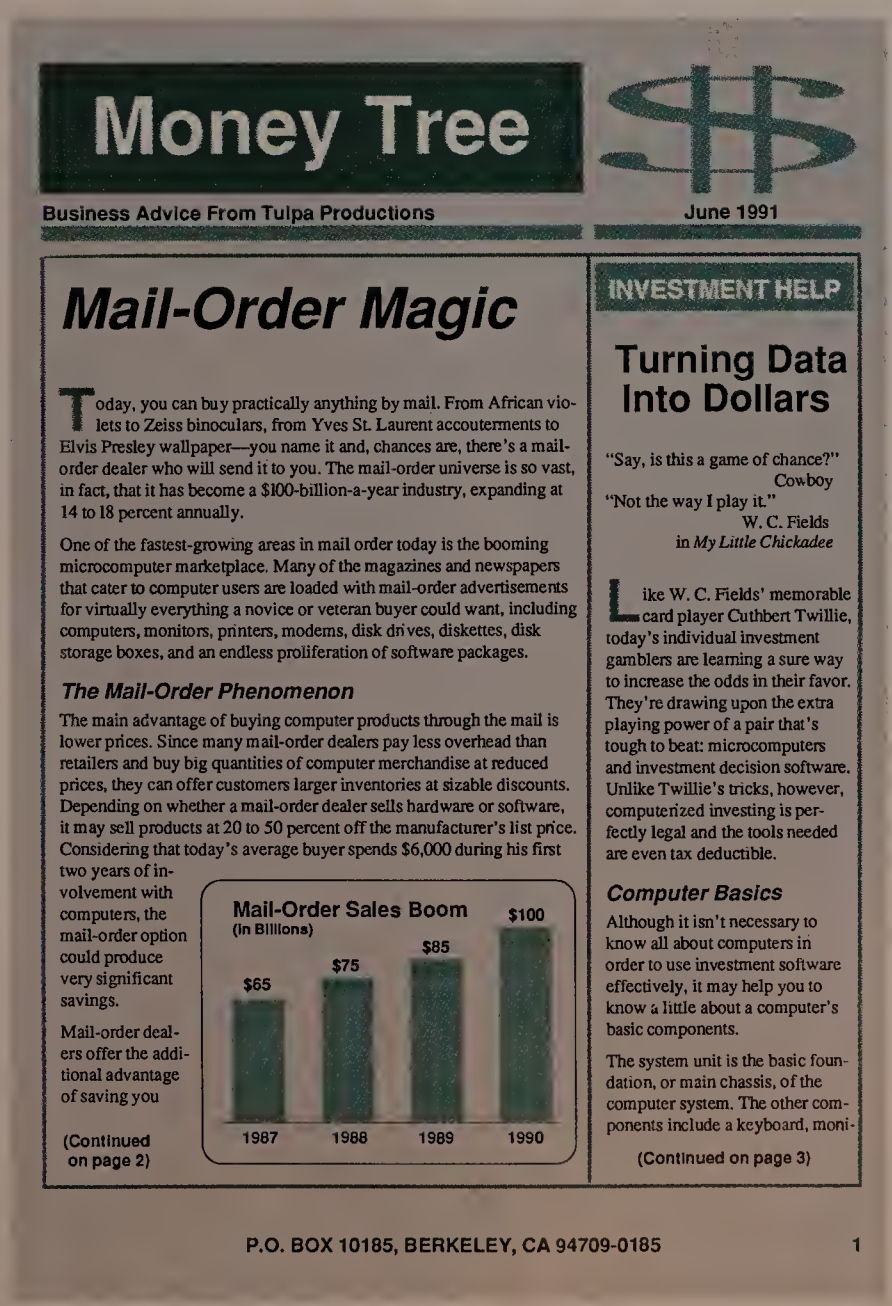
Full-color printing uses four inks—cyan (blue), magenta (red), yellow, and black—to produce the full range of colors required for continuous-tone images such as color photographs. Spot color requires only two color inks: one to print most of a document, and another to highlight items like page borders, rules, and boxes. Because spot color requires less ink and less work than full-color printing, it's much easier and cheaper.

To print spot-color documents, most businesses employ a professional print shop—not every quickie offset shop can handle the job. To specify which elements get which color, you can use your page layout package to print out separate black-and-white copies that correspond to each color, or you can simply bring your master pages to the printer and point. If you need just a handful of copies, it can be more economical to use an in-house color printer and a color copier.

Regardless of how you print your document, you must first develop a spot-color strategy—picking colors and deciding how to use them. Here are some guidelines to help you get started.

- Don't use spot color haphazardly. Use it to organize pages and to guide the reader's eye toward important items.
- Use color consistently throughout a document, employing the same color or color tint for similar types of headings, rules, boxes, and so on.
- Choose bright colors for newsletters or fliers—such as the dollar-bill green used for the financial newsletter shown in **FIGURE 1**. Use more subdued colors like dark blue or maroon for business reports or proposals.
- If you're on a budget, choose stan-

Documents in Living Color



Money Tree

Business Advice From Tulipa Productions — June 1991

Mail-Order Magic

Today, you can buy practically anything by mail. From African violets to Zeiss binoculars, from Yves St. Laurent accouterments to Elvis Presley wallpaper—you name it and, chances are, there's a mail-order dealer who will send it to you. The mail-order universe is so vast, in fact, that it has become a $100-billion-a-year industry, expanding at 14 to 18 percent annually.

One of the fastest-growing areas in mail order today is the booming microcomputer marketplace. Many of the magazines and newspapers that cater to computer users are loaded with mail-order advertisements for virtually everything a novice or veteran buyer could want, including computers, monitors, printers, modems, disk drives, diskettes, disk storage boxes, and an endless proliferation of software packages.

The Mail-Order Phenomenon

The main advantage of buying computer products through the mail is lower prices. Since many mail-order dealers pay less overhead than retailers and buy big quantities of computer merchandise at reduced prices, they can offer customers larger inventories at sizable discounts. Depending on whether a mail-order dealer sells hardware or software, it may sell products at 20 to 50 percent off the manufacturer's list price. Considering that today's average buyer spends $6,000 during his first two years of involvement with computers, the mail-order option could produce very significant savings.

Mail-order dealers offer the additional advantage of saving you

(Continued on page 2)

Mail-Order Sales Boom (In Billions)

INVESTMENT HELP

Turning Data Into Dollars

"Say, is this a game of chance?"
Cowboy
"Not the way I play it."
W. C. Fields
in *My Little Chickadee*

Like W. C. Fields' memorable card player Cuthbert Twillie, today's individual investment gamblers are learning a sure way to increase the odds in their favor. They're drawing upon the extra playing power of a pair that's tough to beat: microcomputers and investment decision software. Unlike Twillie's tricks, however, computerized investing is perfectly legal and the tools needed are even tax deductible.

Computer Basics

Although it isn't necessary to know all about computers in order to use investment software effectively, it may help you to know a little about a computer's basic components.

The system unit is the basic foundation, or main chassis, of the computer system. The other components include a keyboard, moni-

(Continued on page 3)

P.O. BOX 10185, BERKELEY, CA 94709-0185 1

FIGURE 1: Using spot color in documents can be as effective as using full color—and much cheaper to print. This financial newsletter uses green for its logo, rules, and initial caps. A 50 percent green tint adds a third color, and a fourth color effect is created by using light-gray paper.

DESKTOP PRESENTATIONS TOOLBOX

3-D Charts on the Cheap

Need a fast and easy way to produce boffo charts? Order up Bloc Publishing's *3-D Charts To Go*. This $99.95 *Windows 3.0* package helps turn plain spreadsheet data into three-dimensional pie, bar, area, and line graphs.

Creating charts is easy. Simply import a Lotus WKS file or enter data directly into *3-D Charts'* spreadsheet window, and select a chart style. You can rotate the chart and display it in a variety of views, print it, export it as a WMF file, or paste it into programs like *PageMaker*. You can also create a simple on-screen slide show, but no custom drivers for 35mm slide printers are included.

Bloc's program lacks the range of chart styles, data manipulation features, and drawing tools found in high-priced presentation packages. But for adding pizzazz to a newsletter or desktop presentation, *3-D Charts To Go* is an excellent low-budget solution.

3-D Charts To Go $99.95; Bloc Publishing, 800 S.W. 37th Ave. #765, Coral Gables, FL 33134; 305/445-0903
Reader service no. 617

NUTS & BOLTS

Building Dynamic Data Charts

A common way to present information using 35mm slides or overhead transparencies is via a *build series,* in which each successive image reveals a new line of text. But you can also use a build series to present data. The easiest way to produce a data-chart build is to create the final image first, then delete the bars or other graphic items one by one to create the preceding images. Here's how to create a data build series using *Harvard Graphics*. First, create a bar chart showing, say, quarterly profits. Then press <**F8**>, go to page 3 of the Bar/Line Titles & Options screen, and enter a maximum value for the Y1 Axis that's slightly higher than your largest data value—for example, if your largest value is 95, enter 100. (This prevents *Harvard* from automatically resizing the chart when you delete data.) Press <**F8**> to return to the Bar Chart Data screen, press <**F3**>, and save the chart as **SHOWBAR4**. To create the preceding image, delete the data values for the fourth quarter—but don't delete the X-Axis Name. Save this chart as **SHOWBAR3**. Repeat this procedure to create the SHOWBAR2 and SHOWBAR1 charts, and your build series is complete.

dard colors rather than paying the printer to mix custom ones. At the print shop examine color samples printed on the paper stock you plan to use.

- Make sure graphic elements such as borders, rules, and boxes are large enough to carry the color. For example, it's hard to tell the difference between a black rule and a blue rule if the rule is less than 1 point thick.
- Use spot color for short, infrequent text items such as a logo, large initial capitals, subheads, and pull quotes. Headlines and body text usually work best in dark colors like black or navy blue, which provide contrast and are easy to read.
- When printing text against a spot-color background, use *reverse,* or uncolored, type. Because reverse type uses the color of the paper instead of a second ink (such as black), you avoid having colors overlap or misalign.
- If the same color elements appear regularly in every document—page borders, a masthead, or a logo, for example—you can save money by having them preprinted. Since the spot color is already on the page, you pay for only one color (such as black) each time you print a new document.
- For a nominal charge, you can add the effect of a third color to your document by using a tint of the spot color. For example, use a 25 percent tint of a dark color (use a higher percentage with lighter colors) to set off a boxed item such as a table of contents.
- Don't overdo it. For maximum impact, don't use spot color for more than 25 percent of the text and graphics on a page.

You can also add color to your document by using a shade of paper other than white. Just be sure to select a color that's appropriate for your message and contrasts well with the other colors in your document.

PC World *contributing editor Richard Jantz is the author of* Ventura for Windows 3.0 *(John Wiley & Sons, New York, 1991).*

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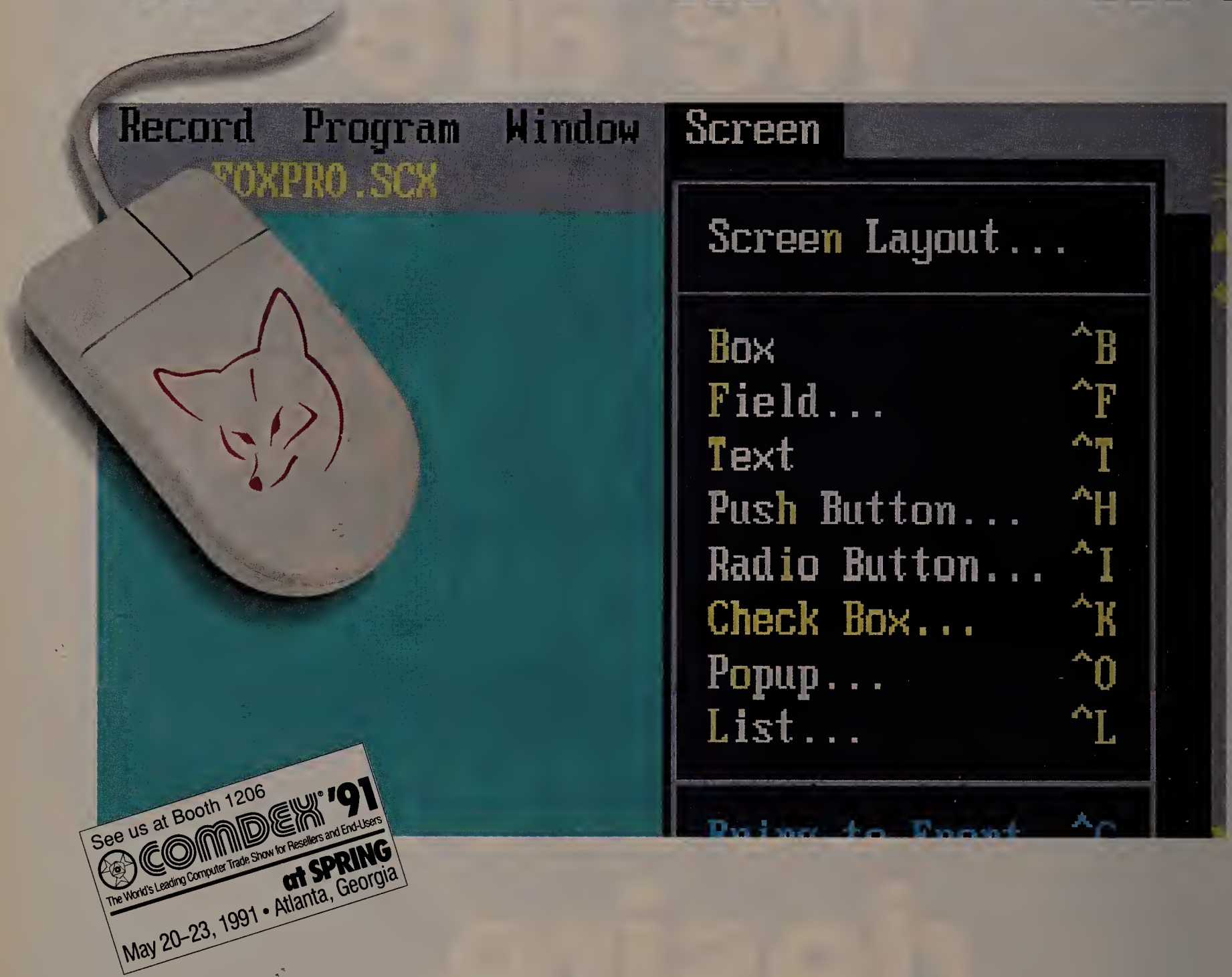
Introducing the DBMS runs like a mainframe



Admit it .

Don't you get just a twinge of envy when you see a Mac user having fun while getting the job done?

You're not alone.

Millions of users who needed the power of the PC but wanted the ease-of-use of a Graphic User Interface (GUI) just splurged on Windows and the expensive hardware needed to get the most out of it.

But you don't have to do that.

Because now there's FoxPro®2.0.

Why should the rich have all the fun.

FoxPro 2.0 gives you the ease-of-use of a Graphic User Interface on your character-based DOS PC.

Use pull-down menus to open multiple windows (in DOS) and see all the data you need to see at once. Build easy-to-use screens for entering and viewing data just by picking-and-clicking to place menus, buttons, checkboxes and scrolling lists anywhere you want them. Create sophisticated, elegant reports without the usual pain. Then assemble

that acts like a Mac and In DOS.

everything into your own custom applications.

Without writing a single line of programming code.

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Our new memory management techniques let you work with the memory you have now while speeding up your applications.

Our new compound indexes are less than a quarter the size of those in competitive products and far, far faster.

Our new Relational Query-By-Example (RQBE) is a simpler, interactive interface to the information you need.

Our new Rushmore™ query optimization† accesses that information two orders of magnitude or more faster‡ than ever before.

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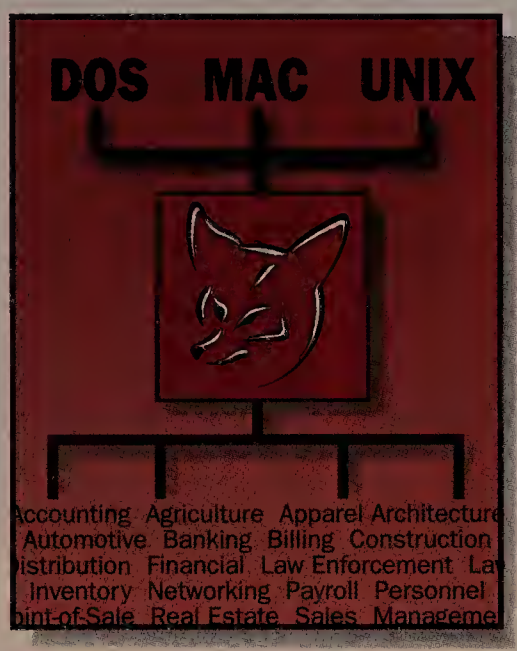

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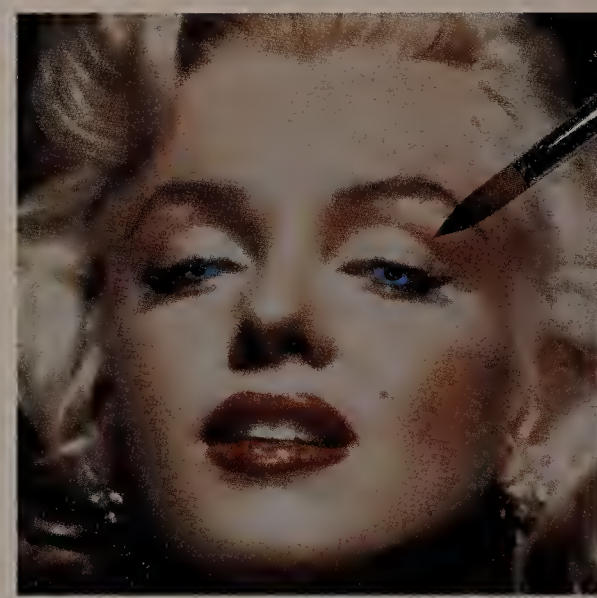

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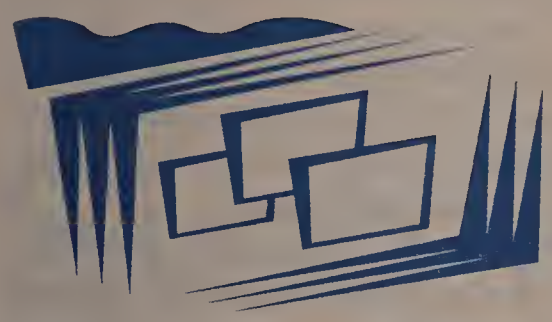
Windows Workshop



Windows

Practical advice on mastering Windows 3.0

This month: Surviving the dreaded UAE

Jesse Berst and Scott Dunn

America's three most feared phrases:

1. Greetings from the IRS! Our audit department has selected your return for...

2. I've looked over the X rays, and I'm afraid a root canal is in order.

3. UNRECOVERABLE APPLICATION ERROR Terminating current application.

This last message, of course, signals that your *Windows* application has just crashed. When you see the dreaded Unrecoverable Application Error (UAE) message, all you can do is click on 'OK', whereupon *Windows* closes the current application without letting you save your work.

But don't despair. Read on, and you'll discover why UAEs occur, what to do when they appear, and some preventive tips.

What Is a UAE?

One of *Windows'* jobs is to assign each application a specific segment of memory. UAEs occur when a program invades a memory location it shouldn't have access to and overwrites or tries to overwrite what's already there—data, another program, DOS, or even *Windows*. When an application oversteps its boundaries, *Windows* shuts it down and pops up a UAE message.

Keep in mind that a UAE probably isn't caused by the application that crashes. Microsoft technical support estimates that 80 to 90 percent of UAEs can be traced to problems in your system's configuration. Common offenders include disk caches, TSRs (especially if loaded before *Windows*), old mouse drivers, display and printer drivers not certified for *Windows*, type managers, *Windows 2.xx* applications, and expansion boards that try to use the same memory *Windows* needs. In some

WINDOWS TOOLBOX

Zip Manager 3.01

A file compression program is a wonderfully handy tool. It can reduce the size of files (often by more than 50 percent) and let you store many individual files inside a single, compressed archive file. If you store a lot of scanned images or send even moderately large files via modem, a file compression utility is a must.

Unfortunately, the leading DOS compression utility, *PKZIP*, is a pain to use, thanks to a welter of arcane command line switches. But with the shareware *Zip Manager 3.01* from Moon Valley Software, you can put a friendly *Windows* face on the product and gain point-and-click access to advanced functions.

For example, you can add a new file to an existing archive, send extracted files to a special subdirectory, make self-extracting files, extract one or more files from an archive, and view file names in an archive. *Zip Manager* is so easy to use, you could easily store all your worksheets in an archive file and simply extract the one you want to work on.

Zip Manager 3.01 has its faults. It's just a shell, so you must obtain the shareware *PKZIP* utilities first. And, as in most shareware programs, the documentation and help files aren't as good as they could be. But the upcoming version 4.0 should fix many of these flaws and add powerful new image compression capabilities as well. Until then, *Zip Manager 3.01* is still the fastest, easiest way to perform file compression under *Windows*.

Zip Manager 3.01 $21.95 registration fee; Moon Valley Software, 107 E. Paradise Ln., Phoenix, AZ 85022; 602/375-9502
Reader service no. 621

Anatomy of a UAE

Windows' job is part traffic cop—it assigns each application its own, inviolable chunk of memory. Unfortunately, a program sometimes crosses the double yellow line and tries to grab another program's RAM. The result? A UAE—a head-on crash that brings Windows to a halt.

cases, the problem is more fundamental: Your old 80286 or Bulgarian clone may not be supported by *Windows* at all.

Safe and Sane Response

When a UAE occurs, *Windows* closes the current application but stays active itself. The temptation is to keep on computing.

Don't. The only completely safe way to respond to a UAE is to exit *Windows* immediately, and press **<Ctrl>-<Alt>-<Delete>** or hit the reset button. This completely clears the PC's memory. If you don't clear memory, the results can be disastrous. The errant application may have mangled data, or worse, *Windows*, compromising all operations.

Preventing UAEs

If you get more than one or two UAE messages per week, take your system back to a simpler time. First, make backup copies of AUTOEXEC.BAT and CONFIG.SYS. Then clean out everything in AUTOEXEC.BAT except PATH and PROMPT commands; strip out everything in CONFIG.SYS except FILES, BUFFERS, and DEVICE=HIMEM.SYS statements. You can also keep essentials like network and disk-partitioning drivers.

To isolate the problem, add the suspect elements back one at a time—use the computer for a week or two, and if the UAEs don't return, restore another element. Eventually, you'll discover the culprit.

In tracking the wild UAE, consider these other tips and caveats:

- Use the system vendor's version of DOS. Running another vendor's DOS can introduce subtle incompatibilities.
- If you want your hard disk partitions exceeding 32MB, use the latest version of DOS 4.*xx*. Third-party disk partitioners can conflict with *Windows*.
- Avoid using third-party device drivers for displays, printers, and other peripherals unless these drivers are supported by Microsoft. Until you can isolate the source of the UAEs, use the drivers that ship with *Windows* or are part of Microsoft's Supplemental Driver Library. You can get the library disks by calling 800/426-9400.
- *Windows* sometimes uses memory addresses between 640K and 1MB, a location normally reserved for adapter boards. If an adapter doesn't properly identify which memory segment it is using, *Windows* could attempt to write over that segment. The solution? Exclude *Windows* from using memory addresses between 640K and 1MB.

Open *Windows'* SYSTEM.INI file and place the line **emmexclude=a000-efff** in the [386Enh] section. If the adapter's manual notes the exact memory segment the board uses, you can modify this statement to cordon off just that segment and reclaim the rest for *Windows*.

- If your PC is networked, make sure you're using the latest network shell. Most older shells aren't compatible with *Windows*. The latest NetWare shell at press time is 3.01e and is available from Novell's CompuServe forum. Type **GO NOVA**, and download the DSWIND.ZIP file.
- Some older 286s and cheap clones are not supported by *Windows* and will generate UAEs by the cartload. You may be able to cure the problem by upgrading the system's BIOS *and* keyboard controller ROM chips. Most system vendors sell these chips as a set.
- Microsoft confirms that *Word for Windows 1.1*'s *WordPerfect 5.*x document converter has a bug that triggers a UAE. Until Microsoft provides an update, avoid this option.

Jesse Berst is a contributing editor for PC World. *He and Scott Dunn are coauthors of* 101 Windows Tips *(Peachpit Press, Berkeley, California, 1991).*

A full-blown server-based network costs a bundle when done right. Add to this the cost of training and ongoing support (sometimes 2 to 3 times the original investment). Undaunted, businesses bite the bullet every day—effectively turning over their entire computer operations to a LAN expert forever. But many, in seeking a less costly alternative, fall into the trap of false economy.

We say "neither is necessary." Why? How?

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Connectivity and networking solutions abound. And with them come traps of all kinds. Unless you're a teflon-coated decision maker (or a job hopper), the solution you choose today should remain appropriate tomorrow. Let's look at where you can go wrong—and right.

First, consider printer sharing boxes. They're a fine short-term solution when you have two or three computers occasionally needing access to a single printer. But, when applied to more extensive or demanding applications, they become a bottleneck that impedes and frustrates users. Wouldn't you call this a bottleneck: a printer sharing box—driven by a *single* microprocessor—receiving print data from *several* computers, while it is simultaneously supposed to send this data to *several* printers? No wonder the makers of these boxes publish performance tests with only *one* user printing! And when the box locks up (as all computer devices do), everyone loses their printing. When it breaks, *nobody* can print until the box is replaced. To add insult to injury, they are often quickly outgrown because they have a finite assortment of inputs and outputs.

If not printer sharing boxes, then consider networks (LANs). They're a *hot* item nowadays, particularly because LANs are one of the few sources of profit left for computer stores. Good networks are EXPENSIVE, and require expert support forever! Guess who benefits from that? If you buy a LAN, you will always be accountable to it, like a state and federal sales tax on every change or addition you make related to your computers.

Not that there aren't inexpensive networks available to snare the penny wise. Some are downright cheap. But, should you build your business around them? Cheapo networks teach harsh lessons in false economy.

You see, some low-cost LANs boast they occupy very little memory (RAM), yet to realistically accomplish what the LAN is supposed to do, it really uses as much or more RAM as any other LAN. The truth is: *all* LANs occupy a rather substantial amount of RAM, and you will likely find yourself either having to add RAM to your PCs (if you can)—along with memory management software, or dumping some of your other software overboard.

An even harsher lesson in false economy comes later, when you buy a multi-user software package (e.g. a database to be shared) and discover it is only guaranteed to be compatible with a server-based data-sharing LAN, usually Novell's®. Oops! Old LAN overboard!

Want to avoid such harsh lessons? Rule number one: if and when your company has some computer users who need a data-sharing network—so they can simultaneously access a shared database—get the best network and server money can buy. Buy a UPS, tape backup… the works. Make the commitment. It's a big step, but you'll regret anything less.

It's highly unlikely, however, that ALL your computer users need—or will ever need—access to a shared database. Most probably just need to share printers and other peripherals like plotters, modems and fax machines. Perhaps everyone would also like to exchange E-Mail and maybe even pass data files between PCs electronically.

Systemizers® are a connectivity solution that will provide these capabilities with none of the traps, drawbacks or excessive costs and commitments previously mentioned. There are five models to choose from, to fit any budget, application and performance requirement—including the powerful Systemizer Plus for CAD and DTP. And they're ALL compatible.

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The Information Edge

Communications

On-line resources for business and professional users

This month: Tap into the best sources for business-related shareware and public-domain software, and get down to earth with geology data bases.

Judy Heim

When it comes to business software, you have two choices: You can buy a commercial package, or you can download shareware (or free public-domain software) that's often just as good.

The two primary sources for on-line software are services like CompuServe, and bulletin boards (BBS's) like Exec-PC. The services generally have bigger file collections, but you pay hourly connect charges. BBS's are free, or else they charge a one-time yearly fee, which still saves you money over the cost of a service if you spend a lot of time on line.

But library size and price aren't everything. The file collection's currency and character and the ease of searching and downloading are equally important. While some collections are stronger in one area, most libraries offer the same (latest) versions of a given package. Exec-PC specializes in business applications, while GEnie, from General Electric Information Services, is strong on graphics utilities. Exec-PC and Channel 1, a similar BBS, provide easier search tools than the big services.

Here are profiles of the six most popular on-line PC software collections, listed in order of claimed library size. Rest assured: All the services and BBS's listed screen their software scrupulously for computer viruses.

GEnie is probably the best choice for now-and-then software searchers. This service is low priced, easy to use, and boasts the largest storehouse of PC programs—over 85,000 titles. You start by choosing a forum like Desktop Publishing or Investment, and a library within that forum, such as Printer Utilities. Then, when prompted, you enter a keyword to scan for. Alternatively, you can browse through descriptions of files, but since each description takes a screen, this method can be slow. Even if you don't browse, GEnie can be sluggish, and it sometimes locks up after downloads. The service will have added 9600-bps support by the time you read this. GEnie is $6 per hour at night, $18 per hour during the day, plus $4.95 a month.

CompuServe Information Service (CIS) boasts the second largest PC file collection. Official guesstimates place it between 37,000 and 55,000 titles. Unfortunately, software is scattered among dozens of libraries, and while a menu-based search utility lets you hunt through 20 IBM forums by keyword and file name, you can't use wild cards (asking to see all programs that start with 'G' and end with '.COM', for instance). Nor does it search any other forums. You can browse through CIS too, but as with GEnie it's time-consuming. CIS is also the priciest choice here: $12.50 per hour for 2400-bps access, $22.50 for 9600-bps, plus network and account charges.

Exec-PC may be the "regular" downloader's best friend. This BBS includes a well-chosen collection of 35,000 PC titles you can search with matchless ease—and download at speeds up to 14,400 bps. To search for software, you can toggle between full-screen menus and prompts. You first choose the operating system and then employ Exec-PC's advanced browse facility, which lets you scan for dates, categories, and multiple keywords. You can review hundreds of programs in minutes. Downloading is equally easy, and you can use your MNP-5 modem. More good news: All you pay is $20 for a three-month subscription, or $60 per year.

Channel 1 is similar to Exec-PC in both the size of its software collection and its ease of use. This BBS's full-color,

ON-LINE TOOLBOX

Let Your Modem Do the Walking

If you dial a lot of phone numbers from your PC screen (clients listed in a data base, say), you should know about a $10 auto-dialer called *Dialthat*. With this unobtrusive 1K TSR loaded in memory, simply hit <**Alt**>-**D**, cursor down to the number, and press <**Enter**>. When dialing is complete, pick up your telephone handset and press the <**Space**> bar to silence the modem.

Dialthat, Real Software, P.O. Box 1680, Soquel, CA 95073; 408/476-3550
Reader service no. 608

menu-driven interface is a pleasure. Software is tucked into 96 application categories. You can search one or more of these libraries by typing in keywords, or you can browse through a scrolling list of files. Channel 1 is slightly more expensive than Exec-PC: $25 for two months, or $85 a year. However, a free 90-day trial subscription is available. You can download at speeds up to 9600 bps, and MNP-5 is supported.

Delphi is the cheapest service listed here. Connection charges can run as low as $1.20 per hour, even during the day. However, with only 10,000 programs, Delphi compares to CIS and GEnie like a bookmobile going up against the New York Public Library. Files are stored in conferences, as on GEnie and CIS, and searching or browsing is easy, with menus at every bend—but you can search only by keyword, not by date. Connect speed is limited to 2400 bps.

Byte Information Exchange's high price, tricky menu, and very thin collection of business software make this service a dubious resource for pinstripe file hunters. Byte estimates its file collection at 3000 to 4000 titles. To locate a file, you must make a series of arcane selections from the main menu. As on the larger services, file descriptions are displayed one at a time, a tedious process. To download, you choose the protocol you want from a menu, but you're limited to 2400 bps. The cost is $156 per year, plus from $2 to $6 per hour, depending on where you live.

One last tip for serious searchers. Four of these libraries support 9600 downloads. If you're on line several times a week hunting for business software, get a high-speed 9600-bps modem. It will pay for itself in no time.

Judy Heim is a contributing editor for PC World.

THE PROFESSIONAL EDGE

Help for the On-Line Geologist

Whether your company plans to build an office tower over a landfill or needs the latest architectural designs for earthquake-proofing a computer room, you'll need to know the lay of the land. Dialog offers three geological data bases that give you everything from the latest seismic reports to information on dam designs suitable for local rock formations. Together, GeoRef, Geobase, and Geoarchive provide nearly 3 million citations drawn from roughly 15,000 scientific journals. Subjects include geology, climatology, ecology, and fossils. You can search by latitude and longitude as well as date and place of publication.

The American Geological Institute's huge GeoRef data base chronicles North American geological studies back to 1785; Geoarchive is its British equivalent. Geobase is a wide-ranging earth sciences data base that covers topics ranging from Third World tectonics to transportation planning. All three are updated monthly. You can also find GeoRef on Orbit Search Services for about the same price—but you don't get access to the other two data bases.

You can search all three data bases as a group, using dozens of search criteria, but Dialog's hieroglyphic interface may put you between a rock and a hard place. Help is only a phone call away, but it's not toll free. Eighty percent of the entries are abstracts, the rest are citations, and most are in English.

At $85 to $99 per hour, plus a per-record access fee of 15 to 40 cents, a $45 subscription charge, and $35 per year for the account, these data bases are pricey, but if your business needs geological data, they're gems.

Dialog Information Services, Inc., 3460 Hillview Ave., Palo Alto, CA 94304; 800/334-2564
Reader service no. 607

For more information about all services in this article, circle reader service no. 901.

WHERE TO BUY

Byte Information Exchange
One Phoenix Mill Ln.
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800/227-2983, 800/225-4129 (modem)
Reader service no. 601

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P.O. Box 338
Cambridge, MA 02238
617/354-2505, 617/354-8873 (modem)
Reader service no. 602

CompuServe
5000 Arlington Centre Blvd.
Columbus, OH 43220
800/848-8199, 614/457-0802
Reader service no. 603

Delphi
General Videotex Corp.
3 Blackstone St.
Cambridge, MA 02139
800/544-4005, 617/491-6642 (fax)
Reader service no. 604

Exec-PC
P.O. Box 57
Elm Grove, WI 53122
414/789-4200, 414/789-4210 (modem)
Reader service no. 605

GEnie
General Electric Information Services
401 N. Washington St.
Rockville, MD 20850
800/638-9636, 800/638-8369 (modem: type **hhh** at the DOS prompt, press **<Enter>**, then type **signup**)
Reader service no. 606

MANAGE
the unmanageable

s an executive consultant with Data Systems Inc., lexandria, Virginia, Jack Anderson was used to pressure, ıt this time he was really in trouble . . .

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he client needed a proposal for updating its outmoded oppy based PC wordprocessing system. These studies ormally take weeks or even months to complete. nterviews, document reviews, procedures analysis, ommunications studies and many other factors must all e taken into account. To make matters worse, not only d the client need it in a week, but the client was a iend, whose new job depended on Jack delivering the oods by Friday. Understandably, Jack was nervous.

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- PERT Charts	✓	✓
- Resources Histograms	✓	✓
- C/SSR Costing Charts	✓	No
Multiple Resource Calendars	✓	No
Plotter support*	✓	✓
WBS Codes*	✓	✓
File Locking on Networks*	✓	✓
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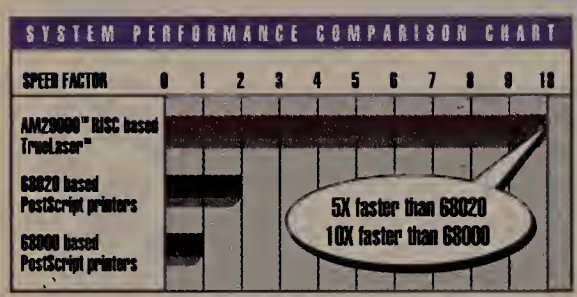

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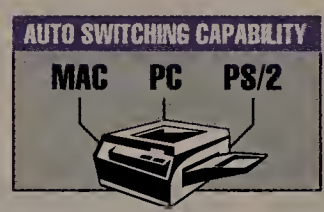

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Circle 164 on reader service card

User Group Tips

Helpful hints from members of the nation's user groups

ASCII for an Easy WordStar File Conversion

I often have to export a document from *WordStar Professional* version 5.5 or 6.0 so that my wife can work on it with *WordPerfect*. When there is no special formatting to consider, I find it quicker to save the file as an ASCII nondocument than to run it through a conversion program. Unfortunately, this method usually creates a mess of unwanted hard returns, one at the end of each line of text. To avoid the chore of deleting every hard return except those that end the paragraphs, open the file in *WordStar*'s document mode, type the dot command **.rm** at the top left margin, and press **<Enter>** to establish the widest possible right margin. Next, press **<Ctrl>-QU** to reformat the text into single-line paragraphs. Press **<Ctrl>-KT** to invoke the Save As command, and enter a new name for the conversion file. This saves the file and brings up the Opening Menu. Press **n<Enter>** to open your conversion file as a nondocument (you'll be automatically prompted with the file name). Delete any lines containing a dot command, and press **<Ctrl>-QU** again, this time to reformat the file as a nondocument. Press **<Ctrl>-KD** or **<F10>** to save the ASCII file. Now it's a snap to open and format the file with *WordPerfect* or any other word processor.

Steve Bass
Pasadena Users Group

Speed Up Your Modem's Dialing and Put Call Waiting on Hold

If your Hayes-compatible modem is a slow dialer on touch-tone lines, don't just sit there drumming your fingers—change its poky ways. Get into terminal mode on your communications program, and simply enter **ats11=50**. Register S11 controls the dialing delay; if your modem supports register S11, setting it to 50 with an AT command gets the lead out of your dialing by cutting the usual default dialing delay almost in half.

If you have call waiting, you probably know that incoming calls can cause your modem to drop the line. In most areas, you can disable call waiting by pressing *70 on your touch-tone phone—if you have a pulse-tone phone, dial 1170. Wait for a dial tone, and then dial out with your modem as you ordinarily would. When you hang up, call waiting will be automatically restored. If this sequence doesn't work in your area, contact your local phone company.

Joe Nuvolini
Colorado Springs Users Group

Expanding Compressed Files? Be Discrete!

If you ever need to download from an on-line BBS, you're bound to encounter compressed files, as they take up less space and provide for faster transmissions. ZIP and ARC formats are the most popular, and you can probably download the utilities that compress and decompress them from the same BBS where you find the compressed programs. Enter the name of the utility by itself at the DOS prompt in the utility's directory to get a screenful of information about syntax, parameters, and options. You should then be able to figure out how to decompress and compress files. But here's a word to the wise: Make sure you direct expansion files into a discrete, empty directory. A plethora of individual files can emerge from each ZIP or ARC file, and it can be a sticky cleanup job if they get mixed in with other data or program files.

Dean Ewalt
Sarasota IBM PC User's Group

Don't Get Bugged by Spreadsheet Formulas

Have you ever typed out a long, involved formula, only to have the program beep and refuse to accept the input into a worksheet cell? And in your frustration, did you finally decide to clear the cell and start over from scratch? When you run into this kind of problem, save yourself some sweat by converting the formula to a label or text entry: Make sure you're in edit mode, take your cursor to the beginning of the entry, add a label or text prefix (usually an apostrophe), and press **<Enter>**. Then look your work over for errors like unmatched parentheses, a 9 where you wanted (, or misspelled range names. When you think the problem is corrected, convert the label back to a formula and see if the program accepts the input. If it doesn't, convert the formula back to a label and continue debugging. If the program does accept the formula, there's still no guarantee that it is logical and will work as desired, which brings up another point: Use sound formula-construction principles—break down your formula, and place various working components in different cells. That way you're less likely to run into problems.

Charles Suitt
North Texas PC Users Group

Are you a user group member with a tip to share? Send it to User Group Tips, PC World, *501 Second St. #600, San Francisco, CA 94107; CompuServe 74055,412; MCI Mail PC World Editorial; or 415/442-1891 (fax)—include your phone number. We pay $50 and throw in a* PC World *T-shirt for each tip we use—and you get to see your name in* PC World.

worthwhile. For that reason, I created two *WordPerfect* macros, ALTU.WPM [see **FIGURE 3**] and ALTL.WPM, that give me one-keystroke case changes.

I also wanted these macros to be able to change the case of an entire block of text with the same keystroke. I included the statement '{STATE}&128~', which returns a value of true if block mode is on and a false if it isn't and tells the macros what I want them to do. When I press **<Alt>-U** in normal editing mode, ALTU.WPM capitalizes the letter at the cursor, but if I mark a block of text and then press **<Alt>-U**, the macro capitalizes every letter in the block.

Stephanie Wong
Salem, Oregon

```
{DISPLAY OFF}
{IF}{STATE}&128~   {;}If·a·block·is·marked
   {GO}convert~    {;}skip·the·next·two·lines
{END IF}
{Block}{Right}     {;}Block·single·character

{LABEL}convert~    {;}Conversion·subroutine
{Switch}U          {;}Convert·block·to·uppercase
```

FIGURE 3: With one keystroke, this WordPerfect macro capitalizes a character or a block of text.

Editor's note: To create the sample macro, enter WordPerfect, *press* **<Home>**, *then* **<Shift>-<F10>**. *At the Define macro prompt, type* **altu** *and press* **<Enter>**. *At the Description prompt, type* **Uppercase character or block** *and press* **<Enter>**. *This will bring you to the macro editing screen, with the {DISPLAY OFF} command already in place.*

You can't simply type the macro as it is shown in **FIGURE 3**. *You must select the macro commands—{;}, {IF}, {STATE}, {GO}, {END IF}, and {LABEL}—from a menu that pops up when you press* **<Ctrl>-<Page Up>**. *You enter standard editing commands, like {Block}, {Right}, and {Switch}, with the same keys you'd use when editing—***<Alt>-<F4>**, **<Cursor Right>**, *and* **<Shift>-<F3>**, *respectively. Only the '&128~', the two 'convert~'s, and the 'U' can and must be typed by hand.*

This macro changes lowercase letters to uppercase. To go the other way, create an almost identical macro called ALTL.WPM. The last line of this macro should be **{Switch}L** *instead of '{Switch}U'.*

Getting the Year by Default

As a follow-up to "Easy Date-Entry Macro for 1-2-3," in January's *User*

(continues)

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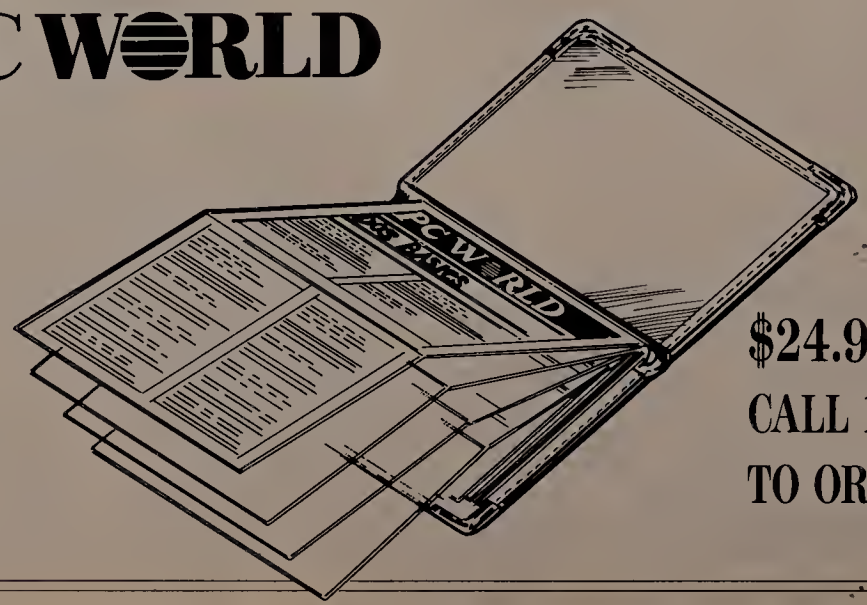

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Group Tips, I'd like to share a *1-2-3* date-entry macro I've used for years. You don't have to type in a year when you enter a date with this macro—it reads a default year from another cell.

To create the macro, enter the labels in **FIGURE 4** into three columns, typing the four apostrophes where indicated (they won't appear in the cells). With the pointer on the cell containing \D, use the */Range Name Labels Right* command to name the macro.

Before using the macro, enter the default year (e.g., **1991**) in cell G1. Then, with the pointer on an appropriate cell, press **<Alt>-D**, enter the desired month, press **<Enter>**, type in the desired day, and press **<Enter>** again. For example, assuming your default year is 1991, pressing **<Alt>-D6<Enter>16<Enter>** would enter a date of June 16, 1991. To enter a year other than the default, press **<Alt>-D**, backspace three characters, and type the new year and a comma before entering the month number.

	A	B	C
1	'\D	'@DATE(	Date Macro
2		@STRING(G1-1900,0)	Semiautomatic year entry
3		',{?},{?})~	User enters month #, day #
4		'/RFD1~	Format date

FIGURE 4: This 1-2-3 macro simplifies the entering of dates by automatically providing the year.

If you prefer to use the current year as your default, replace the macro's second line with **@string(@year(@now),0)**, and change the comment to **Fully automatic year entry.** You won't need to put a year in G1, and you can still backspace to enter a different year number.

H. H. Michael Johl
Montreal, Quebec, Canada

An Executable's Extension

I've made a few mistakes in my day and thought you might appreciate a bit of insight about a February *Star-Dot-Star* item ["A Is for Action"] that commits a mistake in the interest of caution. Your editor's note warns readers never to rename a COM file extension to EXE or vice versa, intimating some foul result.

Actually, from DOS's point of view, it makes no difference whether an executable file's extension is COM or EXE. To see what kind of program it is dealing with, DOS looks not at the extension, but at the first few bytes of the program file. Having a file with the correct EXE or COM extension is merely for human convenience.

D. J. R. Dilworth
Carmel, California

Editor's note: It's true, and the mistake is ours. Changing a program file's ex-
(continues)

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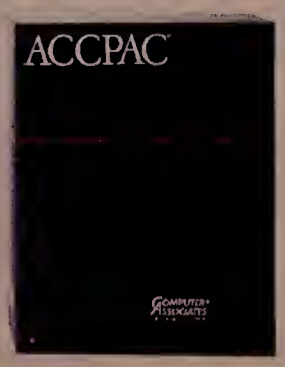

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tension from COM to EXE or vice versa will not confuse DOS. It may, however, confuse any technically minded person working on your system. As we stated in February, however, some programs work properly only with the original file names.

Karl Koessel is the technical editor for PC World.

Have a macro, batch file, short program, or general tip you're proud of? Star-Dot-Star *pays $25 to $200 per tip used. Send your tips to* Star-Dot-Star, PC World, *501 Second St. #600, San Francisco, CA 94107; CompuServe 74055,412; MCI Mail PC World Editorial; or 415/442-1891 (fax). We cannot acknowledge submitted materials.*

POWER TIP NO. 184

Ranking Values With Excel

Excel's powerful array feature lets you create a formula to compute ranks, and the ranks will adjust automatically if your numbers change. If the values to be ranked are in A1:A10, for example, type the following formula in cell B1:

=SUM(IF(A1>$A$1:$A$10,1))+1

Press <Shift>-<Ctrl>-<Enter> to make this an array formula, indicated by surrounding curly braces. If braces do not appear, press <F2> and try again. Copy the formula to B2:B10, and the ranks will be calculated. With large ranges, however, recalculating these formulas can take a while, so you'll be wise to switch to manual recalc mode.

John Walkenbach
San Diego, California

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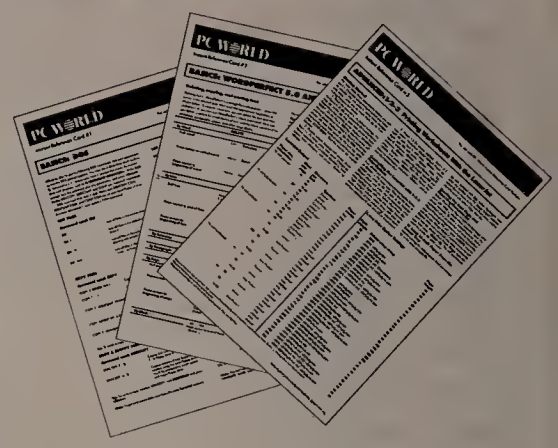

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BASICS: PAGEMAKER 4.0

What to do: You can begin most *PageMaker* tasks by clicking the left mouse button. However, all menu names and options have one letter underlined (bold here) that you use to select the option with the keyboard. Clicking *OK* or pressing **<Enter>** completes many tasks.

USING THE MENU

Task	Mouse	Keyboard
Open menu	Click on menu	**<Alt>** or **<F10>**, type underlined menu letter
Select option	Click on option	Type underlined letter
Open another menu	Click on menu	**<Cursor Left>** or **<Cursor Right>**
Close menu	Click away from menu	**<Esc>** twice

GETTING STARTED

Before creating a new publication, select the target printer and unit of measurement as shown below. Then create a new publication and set the margins, page specifications, default type specifications, and guidelines.

Select printer	**File Target** printer, select desired printer
Select unit of measurement	**Edit Preferences**, set measuring system and vertical ruler
Create new publication	**File New**, set page specifications and margins

Fold Here

Select type specifications	**Type Type** specs; set font, size, leading, style
Add column guidelines	**Options Column** guides; type number, spacing
Add ruler guidelines	Drag new guides from rulers
Adjust guidelines	Drag guides where desired
Remove ruler guidelines	Drag ruler guides off publication
Save publication	**File Save** or **<Ctrl>-S**, type name
Print publication	**File Print** or **<Ctrl>-P**, enter options
Close publication	**File Close**
Leave *PageMaker*	**File Exit** or **<Ctrl>-Q**
Open Help index	**Help Index** or **<F1>**
Get context-sensitive help	**<Shift>-<F1>**, click on object if necessary

ADDING TEXT AND GRAPHICS

To select tools for dealing with text or graphics, click on the appropriate icon in the toolbox or use the keyboard shortcuts below.

Enter text	Select tool or **<Shift>-<F4>**, click on starting location, type text
Draw rectangle or square	Select tool or **<Shift>-<F5>**, click on starting location, draw rectangle (for a square, hold down **<Shift>** while drawing)
Draw oval or circle	Select tool or **<Shift>-<F7>**, click on starting location, draw oval (for a circle, hold down **<Shift>** while drawing)
Draw diagonal line	Select tool or **<Shift>-<F2>**, click on starting location, draw line (for a 45-degree angle, hold down **<Shift>** while drawing)
Draw perpendicular line	Select tool or **<Shift>-<F3>**, click on starting location, draw line
Import text or graphics	**File Place**, select file, *OK*, click on starting location
Continue flowing text	Select pointer tool or **<F9>**, click on text, click on bottom handle, click on location
Flow text around graphic	Select pointer tool or **<F9>**, click on graphic, **Element Text wrap**, click on middle wrap option and *OK*, flow text
Flow text over columns	**Options Autoflow**, flow text either as initial import or as continuation

ADDING TEXT AND GRAPHICS (continued)

Size graphic	Select pointer tool or **<F9>**, click on graphic, drag one of the corner or side handles as desired
Crop graphic	Select tool or **<F8>**, click on graphic, drag one of the corner or side handles as desired

Tip: As a rule, place graphics, then flow text around them.

Note: Use guidelines to align text and graphics. "Snap to guides" provides a magnetlike attraction to guidelines. "Snap to rulers" provides a similar attraction to ruler marks.

Toggle Snap to guides	**Options Snap** to guides or **<Ctrl>-U**
Toggle Snap to rulers	**Options Snap** to rulers or **<Ctrl>-<Shift>-Y**

GETTING AROUND

The easiest way to get around is to click the mouse where you want to go. *PageMaker* also has keyboard commands for this purpose.

Go to beginning of line	**<Home>**
Go to beginning of paragraph	**<Ctrl>-<Cursor Up>**
Go to beginning of sentence	**<Ctrl>-<Home>**
Go to beginning of story	**<Ctrl>-<Page Up>**
Go down a line	**<Cursor Down>**
Go down a screen	**<Page Down>**
Go to end of line	**<End>**
Go to end of sentence	**<Ctrl>-<End>**

Fold Here

Go to end of story	**<Ctrl>-<Page Down>**
Go to page 5	**<Ctrl>-G5**
Go left a character	**<Cursor Left>**
Go left a word	**<Ctrl>-<Cursor Left>**
Go to next page	**<F12>**
Go to next paragraph	**<Ctrl>-<Cursor Down>**
Go to previous page	**<F11>**
Go right a character	**<Cursor Right>**
Go right a word	**<Ctrl>-<Cursor Right>**
Go up a line	**<Cursor Up>**
Go up a screen	**<Page Up>**

CHANGING THE VIEW

You can change the view using the Page menu, the mouse, or keyboard shortcuts. The independent mouse commands use the *right* mouse button. Page menu commands are shown if no mouse shortcut exists.

View actual size (100%)	Click right button or **<Ctrl>-1**
Fit in window	Click right button or **<Ctrl>-W**
View 25% of actual	**Page** 25% **size** or **<Ctrl>-0**
View 50% of actual	**Page** 50% size or **<Ctrl>-5**
View 75% of actual	**Page** 75% size or **<Ctrl>-7**
View 200% of actual	Hold **<Shift>** and click right button or **<Ctrl>-2**
View 400% of actual	**Page** 400% size or **<Ctrl>-4**

Turning Screen Objects On and Off

Toggle Color palette	**Window Color** palette or **<Ctrl>-K**
Toggle rulers	**Options Rulers** or **<Ctrl>-R**
Toggle scroll bars	**Window Scroll bars**
Toggle Style palette	**Window Style** palette or **<Ctrl>-Y**
Toggle Toolbox	**Window Toolbox** or **<Ctrl>-6**
Toggle all guides	**Options Guides** or **<Ctrl>-J**

PC WORLD

Instant Reference Card #13

For use with PC World Instant Reference Card Portfolio

ADVANCED: PAGEMAKER 4.0

MANIPULATING TEXT AND GRAPHICS

Before you con monipulote o block of text or o grophic, you must first select it by clicking on it with the pointer tool. To select severol objects, hold down **<Shift>** while clicking on them, or drag o box oround the objects ("rubber bonding"). To select oll the objects on a poge, choose **E**dit Select **a**ll or press **<Ctrl>-A**.

Note: Text and grophics in the some ploce on o poge ore in layers. When you click on an object, you moy not get whot you wont becouse it is under onother loyer. You con move o loyer with one of two *PogeMoker* commonds.

Move top loyer to bottom	Element **S**end to bock or **<Ctrl>-B**
Move bottom loyer to top	Element **B**ring to front or **<Ctrl>-F**

Rearranging Objects

Copy to clipboord	**E**dit **C**opy or **<Ctrl>-C** or **<Ctrl>-<Insert>**
Cut (remove) to clipboord	**E**dit Cut or **<Ctrl>-X** or **<Shift>-<Delete>**
Delete permanently	**E**dit Clear or **<Delete>**
Move	Drog object with mouse or use Cut ond Poste
Paste from clipboord	**E**dit **P**oste or **<Insert>** or **<Ctrl>-V** or **<Shift>-<Insert>**
Undo last action	**E**dit **U**ndo or **<Ctrl>-Z** or **<Alt>-<Backspace>**

Changing Objects

Chonge controst	Element **I**moge control, select settings
Chonge line width	Element **L**ine, select width ond style
Chonge rounded corners	Element Rounded **c**orners, select style
Change shading or fill	Element **F**ill, select pottern or degree
Change colors	Element **D**efine colors, select color ond edit
Rotate text block	Element Text **r**ototion, select degree of rototion
Add poge(s)	**P**oge **I**nsert poges, enter number and locotion
Delete poge(s)	**P**age **R**emove poges, enter poge number(s)

Selecting Text

Select the text tool, ond highlight text by drogging over it. To select all the text in a story, choose **E**dit Select **a**ll or press **<Ctrl>-A** while the text tool is octive. Portions of text con olso be selected using the keyboard.

Select choracter left	**<Shift>-<Cursor Left>**
Select chorocter right	**<Shift>-<Cursor Right>**
Select line obove	**<Shift>-<Cursor Up>**
Select line below	**<Shift>-<Cursor Down>**
Select to line beginning	**<Shift>-<Home>**
Select to line end	**<Shift>-<Enter>**
Select porogroph	Triple-click on it
Select to paragraph beginning	**<Ctrl>-<Shift>-<Cursor Up>**
Select to parogroph end	**<Ctrl>-<Shift>-<Cursor Down>**
Select to sentence beginning	**<Ctrl>-<Shift>-<Home>**
Select to sentence end	**<Ctrl>-<Shift>-<End>**
Select to story beginning	**<Ctrl>-<Shift>-<Page Up>**
Select to story end	**<Ctrl>-<Shift>-<Page Down>**
Select word	Double-click on it
Select word left	**<Ctrl>-<Shift>-<Cursor Left>**
Select word right	**<Ctrl>-<Shift>-<Cursor Right>**

Formatting Text

Center text	**T**ype **A**lignment **C**enter or **<Ctrl>-<Shift>-C**
Left-align text	**T**ype **A**lignment **L**eft or **<Ctrl>-<Shift>-L**
Right-align text	**T**ype **A**lignment **R**ight or **<Ctrl>-<Shift>-R**
Justify text	**T**ype **A**lignment **J**ustify or **<Ctrl>-<Shift>-J**
Force text to fill line	**T**ype **A**lignment **F**orce justify or **<Ctrl>-<Shift>-F**

Formatting Text (continued)

Bold text	**T**ype **T**ype style **B**old or **<F6>** or **<Ctrl>-<Shift>-B**
Itolic text	**T**ype **T**ype style **I**tolic or **<F7>** or **<Ctrl>-<Shift>-I**
Normal text	**T**ype **T**ype style **N**ormol or **<F5>** or **<Ctrl>-<Shift>-<Space>**
Reverse text	**T**ype **T**ype style **R**everse or **<Ctrl>-<Shift>-V**
Strike-through text	**T**ype **T**ype style **S**trikethru or **<Ctrl>-<Shift>-S**
Underline text	**T**ype **T**ype style **U**nderline or **<F9>** or **<Ctrl>-<Shift>-U**
All copitol text	**T**ype **T**ype specs **C**ase All cops
Smoll capitol text	**T**ype **T**ype specs **C**ose Small cops or **<Ctrl>-<Shift>-H**
Subscript text	**T**ype **T**ype specs **P**osition Subscript or **<Ctrl>-**
Superscript text	**T**ype **T**ype specs **P**osition Superscript or **<Ctrl>-<Shift>-**
Select typefoce or font	**T**ype **F**ont, select typefoce
Select type size	**T**ype **S**ize, select size or select **O**ther and size
Next larger standord size	**<F4>** or **<Ctrl>->**
Next smoller stondord size	**<F3>** or **<Ctrl>-<**
Set line spocing or leoding	**T**ype **L**eoding, select size or select **O**ther ond point size or **<Ctrl>-<Shift>-A** for outo (120%) leoding
Set chorocter width	**T**ype Set **w**idth, select width or select **O**ther ond type width or **<Ctrl>-<Shift>-X** for normol (100%) width
Set charocter spocing	**T**ype **T**rock, select type or **<Ctrl>-<Shift>-Q** for no trock
Monuol kern oport	**<Ctrl>-<Shift>-<Backspace>**
Manuol kern together	**<Ctrl>-<Backspace>**
Remove monuol kerning	**<Ctrl>-<Shift>-0**
Set hyphenation specs	**T**ype **H**yphenation or **<Ctrl>-H**, enter specs
Set parograph specs	**T**ype **P**oragraph or **<Ctrl>-M**, enter specs
Set tabs	**T**ype **I**ndent/tabs or **<Ctrl>-I**, select style, locotion, ond leoder
Define styles	**T**ype **D**efine styles, enter new style ond set choracter, parogroph, ond tab formatting
Select styles	**T**ype **S**tyle, select style

USING THE STORY EDITOR

First, click in the text to be edited.

Enter story editor	**E**dit **E**dit story or **<Ctrl>-E**
Check spelling	**E**dit **S**pelling or **<Ctrl>-L**, select seorch options, and select *Stort*. For unrecognized words, select or type the correct word and click Reploce (or click Ignore)
Seorch for word or phrose	**E**dit **F**ind or **<Ctrl>-8**, type text to find, select options, and click on *Find*. To bose the seorch on text format rother thon content, click on *Attributes*
Continue search	**E**dit Find ne**x**t or **<Ctrl>-<Shift>-9**
Reploce words or phroses	**E**dit **C**honge or **<Ctrl>-9**, type text to find ond chonge, then select options. Click on either *Find* or *Chonge all*. To change text formot rother than content, click on *Attributes*
Disploy special charocters	**O**ptions **D**isploy ¶
Import text into story editor	**S**tory **I**mport, select file
Return to layout view	**E**dit **E**dit loyout or **<Ctrl>-E**
Leove story editor	**S**tory **C**lose story or **<Ctrl>-<Shift>-E**

Fold Here

Fold Here

For use with PC World Instant Reference Card Portfolio

DEVELOPER'S TOOLBOX

Turbo Pascal for Windows: Out With the Old, In With the New

Tom Swan

My search for an easy-to-use *Windows* development system may be over. From the looks of a prerelease copy of Borland's *Turbo Pascal for Windows 1.0*, it's time to bury the notion that *Windows* programming requires months of study, an armload of 800-page books, years of experience with C, and intimate knowledge of the *Microsoft Windows Software Development Kit.*

A key *TPW* feature, the Object Windows Library, or OWL, slices through that complexity like a taut wire cuts cheese. Similar in design to Turbo Vision—*Turbo Pascal 6.0*'s DOS counterpart—OWL is a high-powered, object-oriented tool set that provides a fresh interface to *Windows*' hundreds of functions.

You can write conventional *Windows* code with *TPW*, but once you start using OWL, you'll want to kiss convention good-bye. For instance, instead of writing a classic message loop to handle events such as mouse clicks, I just add a method to an OWL object. When someone clicks the mouse, OWL calls my method—a simple plan that merges *Windows* and OOP (object-oriented-programming) techniques without sacrificing performance.

Several utilities are bundled with *TPW*. For designing resources, there's the *Whitewater Resource Toolkit*, an all-in-one tool for creating hot-key accelerators, bit maps, cursors, dialogs, icons, menus, and strings. You can also create resources from text scripts compiled by Microsoft's Resource Compiler, licensed by Borland. For debugging, *TPW* offers Turbo Debugger for Windows, a special version of Borland's popular debugger. Unfortunately, the debugger runs full-screen, not in a window, and runs only on systems using standard *Windows* video drivers. Still, TDW is essential for investigating hard-to-find bugs and sifting through *Windows* messages.

Turbo Pascal for Windows, with its Object Windows Library and bundled Whitewater Resource Toolkit, eliminates the need for traditional, hard-to-learn, C-based Windows programming tools.

TPW provides complete access to *Windows*' extensive API. *TPW* fully supports Multiple Document Interface (MDI) applications, Dynamic Link Libraries (DLLs), and Dynamic Data Exchange (DDE) facilities. However, implementing these demanding features required Borland to modify its Pascal language, making *TPW* incompatible with the DOS *Turbo Pascal* compiler. For instance, *TPW* includes a Strings unit for working with null-terminated strings. Objects support dynamic methods that can be linked to *Windows* messages. And for DOS compatibility, WinCrt and WinDOS are included; they're similar but not identical to the Dos and Crt units in *Turbo Pascal 6.0*. So don't throw away your DOS compiler; *TPW* is *Turbo Pascal*, but it's geared strictly to *Windows*.

A large-memory command-line compiler, reportedly in the works for a future release, would be welcome. The supplied command-line compiler is a DOS program and is therefore subject to DOS's 640K RAM barrier—a limit not imposed by the integrated *TPW* compiler and editor.

In my opinion, *Turbo Pascal for Windows* is the best-designed, best-conceived, and best-executed *Windows* development system ever produced. Unless something better comes along, I'll use *TPW* for all my *Windows* tasks.

Tom Swan is the author of Mastering Turbo Pascal 5.5 *(1990) and other books published by Howard W. Sams, Carmel, Indiana.*

WHERE TO BUY

Turbo Pascal for Windows 1.0
Borland Int'l
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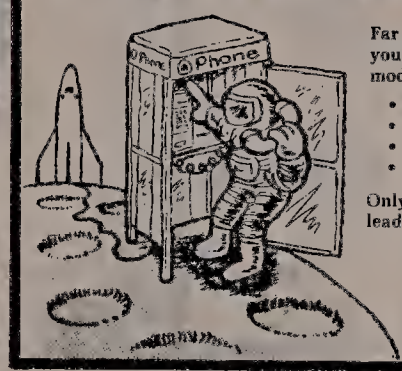

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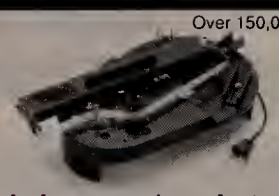

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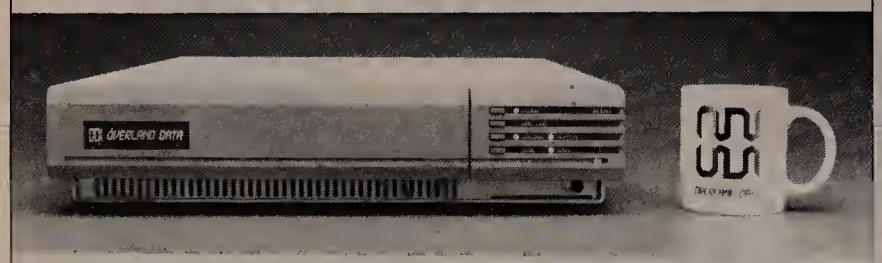

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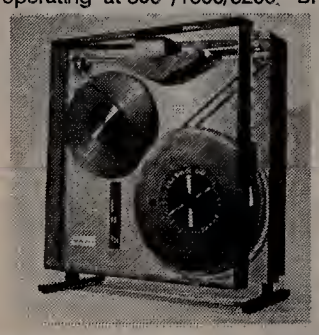

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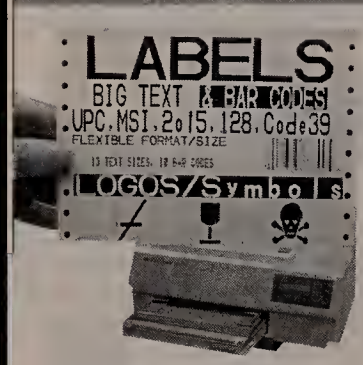

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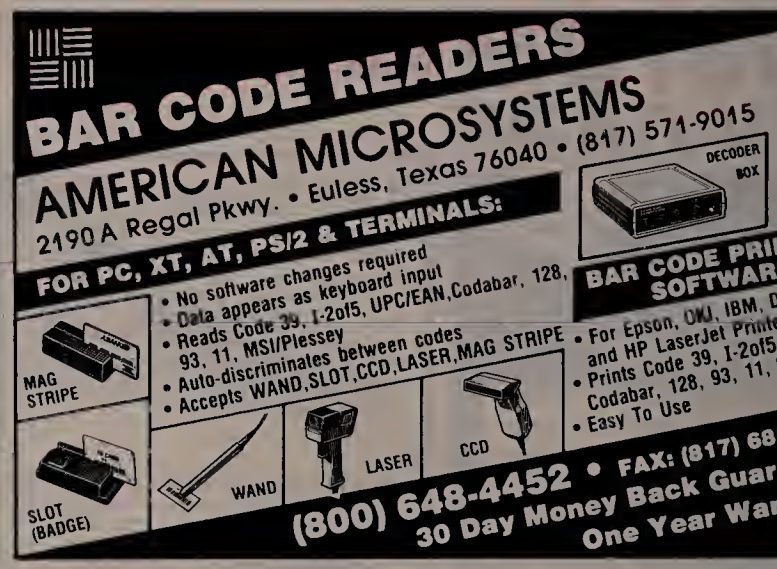

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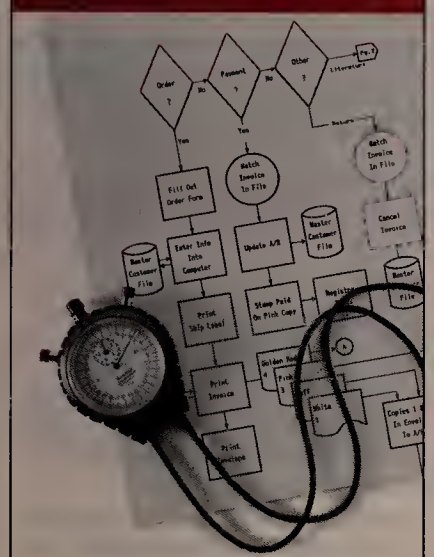

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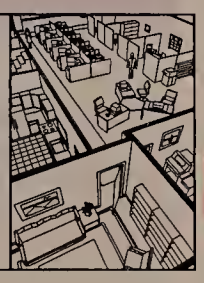

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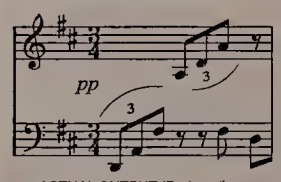

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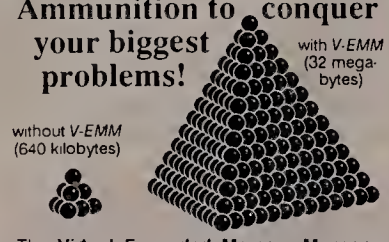

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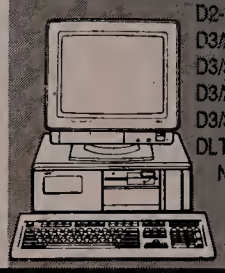

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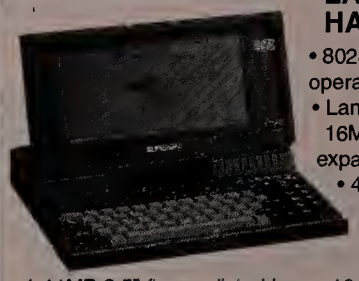

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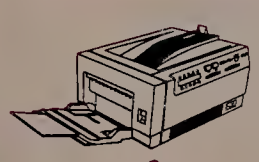

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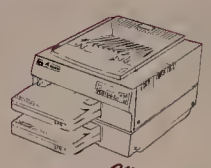

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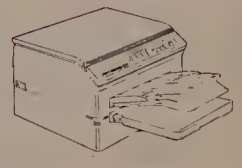

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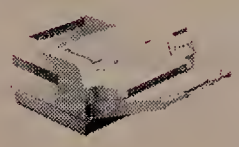

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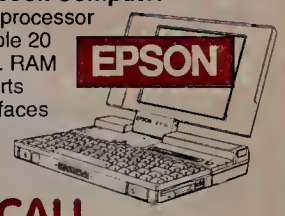

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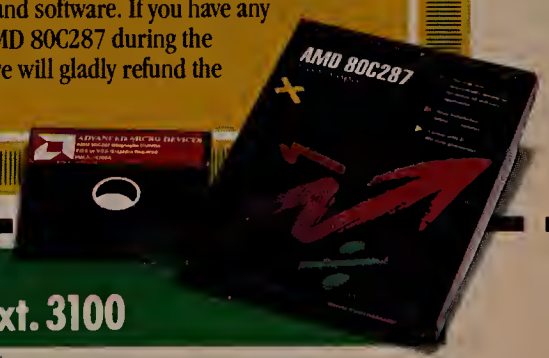

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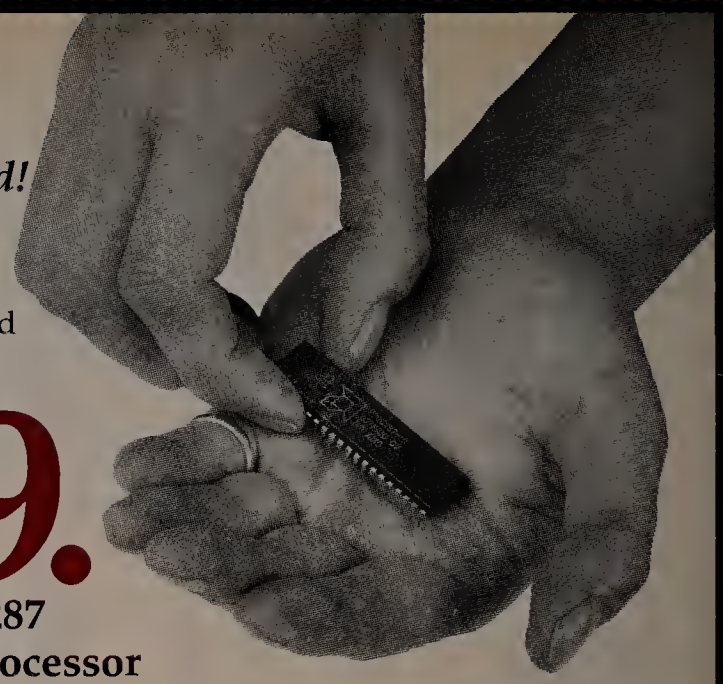

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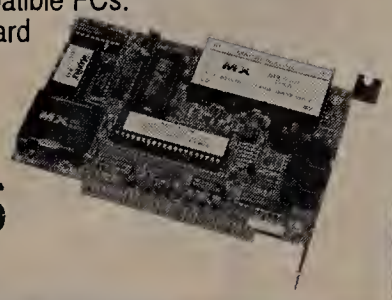

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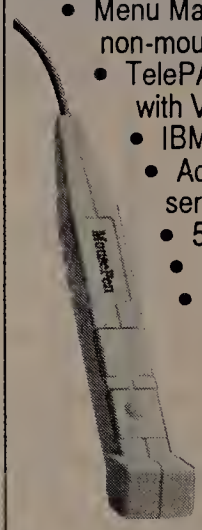

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CAT. #	DESCRIPTION	NSI
30F5348	512KB Upgrade PS/2 30 286	44.00
30F5360	2MB Upgrade PS/2 30 286	128.00
6450372	2MB Memory Adapter 6450367	395.00
6450603	1MB SIMM PS/2 70-E61; 121	68.00
6450604	2MB SIMM PS/2 50Z-70	108.00
6450608	2MB SIMM PS/2 70 - A21	128.00
34F2933	4MB SIMM PS/2 55SX; 65SX	279.00
6450375	1MB Mem. BD PS/2 80-041	96.00
6450379	2MB Mem. BD PS/2 80 111-321	158.00

CAT. #	DESCRIPT.	NSI
6451060	4MB Mem.BD PS/2 80-A21;A31	298.00
6450605	2-8MB Xpand Mem. PS/2 70&80 w/2MB	348.00
34F3077	2-14MB Xpand BD. PS/2 70&80 w/2MB	388.00
6450609	2-14MB Xpand BD. PS/2 50-65SX w/2MB	388.00

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COMPAQ MEMORY

CAT. #	DESCRIPTION	NSI
107331-001	512KB Upgrade Portable III	38.00
107332-001	2MB Upgrade Portable III	118.00
107651-001	1MB Module Portable 386	218.00
107653-001	4MB Xpand Mem. Portable 386	630.00
107654-001	4MB Mem. Xtension Portable 386	630.00
108069-001	1MB Xpand Memory DP386-16	288.00
108070-001	4MB Xpand Memory DP386-16	630.00
108071-001	1MB Memory Upgrade DP386-16	108.00
108072-001	4MB Memory Upgrade DP386-16	438.00
110235-001	1MB Memory BD Slt 286	162.00
110237-001	4MB Memory BD Slt 286	630.00
112534-001	4MB Module DP386S-16	298.00
113131-001	1MB Module DP386286E, 386 20-25E	96.00
113132-001	4MB Module DP2886E, 386 20-25E	228.00
113633-001	1MB Xpand Mem. DP386S-16	148.00

CAT. #	DESCRIPTION	NSI
113634-001	4MB Xpand Mem. DP386S-16	358.00
113644-001	1MB Xpand Mem. DP386 20E, 25E	148.00
113645-001	4MB Xpand Mem. DP386 20E, 25E	358.00
113646-001	1MB Module DP386S-16	110.00
115144-001	1MB Module DP386-33, 486-25, Syspro	158.00
116561-001	8MB Module 486-25, Syspro	899.00
116568-001	32MB Module DP486-25, Syspro	4,990.00
117077-001	512KB Mem. BD Portable LTE	119.00
117081-001	1MB Mem. BD Portable LTE 286	99.00
117081-002	2MB Memory BD Portable LTE 286	158.00
118688-001	1MB Module DP286N, 386N	90.00
118689-001	2MB Module DP386N, 386S-20	168.00
118690-001	4MB Module DP286N, 386N,	396.00

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CAT. #	DESCRIPTION	NSI
PC10-PA8304U	2MB Memory Card Portable T5200 Toshiba Destop T8500	168.00
PC12-PA8307U	2MB Memory Card Portable T3200SX	168.00
PC13-PA8306U	2MB Memory Card Portable T1200XE	168.00
PC14-PA8311U	1MB Memory Card Portable T1000SE-XE	218.00
PC15-PA8308U	2MB Memory Card Portable T3100SX	162.00

CAT. #	DESCRIPTION	NSI
PC15-PA8310U	4MB Memory Card Portable T3100SX	378.00
PC6-PA7137U	3MB Memory Card Portable T3200	228.00
PC7-PA8301U	2MB Memory Card Portable T5100	168.00
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64x4		2.00	2.15			
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1MBx1		4.75	5.00	5.35	6.00	7.00

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Cat. #		WORKS WITH	NSI
H33474B	1MB	HPLaser Jet IIP,III, IIID	99.95
H33475B	2MB	HPLaser Jet IIP,III, IIID	139.95
H33477B	4MB	HPLaser Jet IIP,III, IIID	214.95
H33443B	1MB	HPLaser Jet II & IID	99.95
H33444B	2MB	HPLaser Jet II & IID	139.95
H33445B	4MB	HPLaser Jet II & IID	214.95
1039136	1MB	IBM Laser 401S	139.00
1039137	2MB	IBM Laser 4019	185.00

Cat. #		WORKS WITH	NSI
1038675	3.5MB	IBM Laser 4019	229.00
M6005	1MB	Apple LaserWriter II/NTX	85.00
M6006	4MB	Apple LaserWriter II/NTX	319.00
S63-1300	1MB	Canon LBP-8II	119.00
S63-1880	2MB	Canon LBP-8II	189.00
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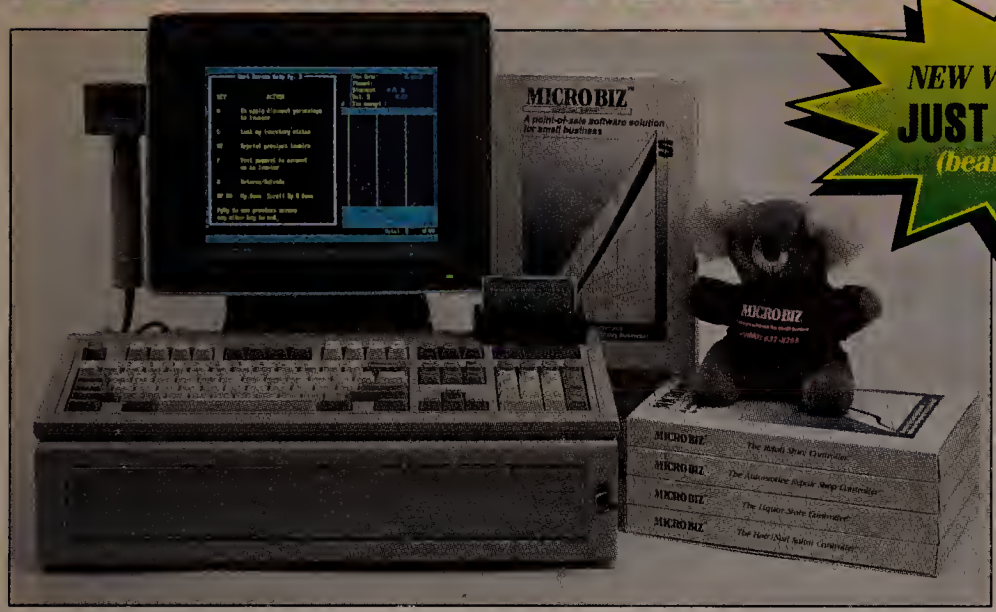

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Record Control in Record Time

With **The Retail Controller Jr.**, you'll make smarter management decisions because you'll have pushbutton-quick, down-to-the-penny information. Operating at your sales counter, the program captures vital customer and sales data, organizes it, and presents it in neat, accurate reports that eliminate guesswork and improve control.

Bar Code Easy, Feature Packed

The Retail Controller Jr. is designed for first-time computer users. Even a brand new clerk can learn how to process transactions in minutes. The speed and efficiency of barcoding (optional) can keep keystrokes to a minimum. Pull- down menus, on-screen help windows, and "point and select" customer and product lookup all help to make the program almost intuitively easy to use. All transactions are performed from just one Work Screen. Yet it incorporates many of the features you'd expect to find only in systems costing hundreds of dollars more, features like:

- ✔ automatic credit card verification
- ✔ bar code compatibility
- ✔ color/size matrix
- ✔ multiple pricing levels
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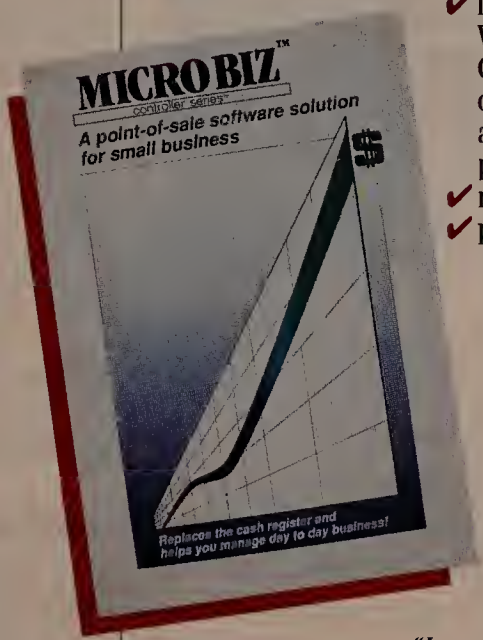

"I can't imagine running my shop without it. The program gives me much better control over all my items and has more than paid for itself."
—G. Truglia, Car-Tune, New City, NY

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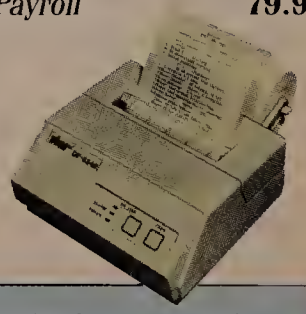

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TAKING IT HOME

The practical guide to home/office computing

Getting in the fast lane with remote computing

Steve Bass

Rush hour lasts all day in Los Angeles. That's why I hate getting on the freeway—especially when it's just to head back to the office to retrieve a forgotten file. The file I need just never seems to be on the right computer.

I know it doesn't sound like rocket science—copy the day's files onto a floppy, take the disk home, and transfer them to the home computer's hard disk. But keeping track of 20 files from numerous projects means spending as much time copying as creating files. And half the time, I simply leave the disk I need sitting in the computer that's where I'm not.

I've changed my tactics. I decided to stop schlepping the files around and instead keep them centralized. I leave all my files on my office hard disk and use a remote communications program to access what I need as I need it.

The idea behind remote-control programs is simple—you use a modem to establish a connection and take control of the computer you've called. It's just like sitting in front of the host computer, but you can be hundreds or thousands of miles away. You see the same screen on the remote computer, and every keystroke you make is immediately relayed over phone lines to the host. Choose a program to load into the off-site computer's memory and you're in the driver's seat. Until recently, though, a slow modem and inadequacies in remote programs made the process unbearably tedious for me.

I tried all the remote packages and found one shortcoming or another in all but *pcAnywhere,* which is a snap to set up and use. Before I leave the office each night, I call up the *PC-Host* portion of the program, and it waits for my incoming call. Once I get home, I make the connection just by dialing in.

When I'm on the road, I can call in to the office with either my Toshiba or Poqet laptop and tap 80 megabytes worth of files. Password protection assures me that I'm the only one who can.

LLOYD DANGLE

I also use *pcAnywhere* to help user group associates who own the program's host module. Instead of trying to talk them through a problem ("No, type the word *type,* then a space and then..."), I make the remote connection and solve the mystery while they watch. When my group's newsletter editor wants changes in my column, it's quicker to call his computer remotely and make the changes on his machine while he scrutinizes the results.

But as easy as *pcAnywhere* is to use, don't even consider running it at 1200 bits per second. A 2400-bps modem is tolerable, but some applications are so big that you'll still grow impatient. If you think you'll be a frequent remote user, it's probably worth it to buy a 9600-bps modem. Prices have come way down this year, and you'll save money in line charges and precious time.

I use a USR Courier V.32bis at home and Intel's 9600EX at the office. I don't worry about the integrity of file transfers because both modems support V.42 error correction as well as the V.42bis protocol, a data compression standard that can speed up data transfers to almost 38,400 bps under ideal conditions. I like external modems because they are easy to move among computers.

Now I only have to face the freeway twice a day. If I had a car phone, I could plug one of those laptop/fax/modem/answering machines into my cigarette lighter, and finally put those long waits in traffic to good use.

Contributing Editor Steve Bass is a family therapist and president of the Pasadena IBM Users Group.

Courier V.32bis $995; U.S. Robotics; 800/342-5877, 708/982-5235 (fax)
Reader service no. 618

Intel 9600EX $799; Intel PCED; 800/538-3373, 800/525-3019 (fax)
Reader service no. 619

pcAnywhere IV remote and host $179, host only $129; DMA; 516/462-0440
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For more information about all products in this article, circle reader service no. 903.

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☐ 386SX-based systems ☐ Other: _____
☐ i486-based systems

2. Are you interested in computer products for:
☐ Home ☐ Business ☐ Resale

3. If for resale, please identify your primary customers:
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4. How many PCs does your company plan to purchase in the next twelve months?

Quantity	Timeframe	Quantity	Timeframe
_____	Less than 1 month	_____	6-12 months
_____	1-3 months	_____	More than 12 months
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5. What do you plan to use computer products for?

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